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# The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of

## Practical Therapeutics

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## ORIGINAL COMMUNICATIONS.

### GASTROENTEROPTOSIS.


BY MARTIN E. REHFUSS, M.D.,

Associate in Medicine in the Jefferson Medical College of Philadelphia.


Gastroenteroptosis is unquestionably one of the most important problems of modern medicine. Even though we hesitate to define the limits between normal and pathological position of organs, the fact remains that in one-half of all cases by both physical examination and fluoroscopy it can be demonstrated that the organs show a distinct tendency toward prolapse. It is difficult to define that border-line just as it is difficult to accurately define the exact limit of mobility of any movable organ. I can recall when in Europe only a few years ago a stomach below the navel was considered low. Now we realize that, in women at least, the lower pole of the organ in the upright position is almost always below that point except in individuals who are short and obese. Some time later many European radiologists defined the limits of the stomach in the upright position as a line intersecting the iliac crests; to-day we are inclined to take a point intersecting the anterior superior spines. In frank gastroptosis the stomach may approach, and frequently does, the brim of the pelvis, and this without any evidence of true dilatation.

Even more difficult to define is the normal limit of various segments of the bowel. This is particularly the case with the small bowel, which on fluoroscopic examination we find so often concentrated in the pelvis. The cecum, hepatic and transverse flexure, and even the splenic flexure are difficult to accurately define in this way. It is therefore not surprising to hear one clinician exclaim that it *makes little difference where an organ is as long as it performs its function.*

Our studies on the gastric secretion in health showed that contrary to existing beliefs there were marked variations consistent with perfect health. These variations we divided into three groups—a hyper-, hypo-, isosecretory type. It seems that such will eventually be the fate of the question of gastric and intestinal position.

There are several points however regarding gastroenteroptosis which have been extremely interesting to me and which appear to be of great importance.

(I) Authorities are agreed that there are two types of the disease—one which is congenital, the other acquired. It seems to me that we must realize that in all types of ptosis, apart from those displacements of organs due to adhesions and new growths, there has existed in the individual a certain state or form of tissue which makes organ displacement extremely likely. It is well to recognize first and foremost this most important fact, that in congenital cases, forming by far the greatest number, there are constitutional evidences of disease: the ophthalmologist reports that the errors of accommodation and refraction are systemic, and different examinations yield varying errors in refraction; the laryngologist reports nasopharyngeal catarrh, which he assures the patient will only clear up when

his general condition improves; the internist, apart from the gastrointestinal findings, discovers a puzzling array of facts varying from pronounced autonomic symptoms, vasomotor anomalies, low blood-pressure, endocrine disturbances, frequently suspected pulmonary foci, characteristic skeletal disturbances such as acute epigastric angle, elongated xypho-pubic line, narrow anteroposterior diameter of both the chest and abdomen, and the floating tenth rib, besides an array of gastrointestinal symptoms. *In other words, there exists a constitutional and systemic defect affecting not merely the obviously prolapsed organs but the smooth musculature throughout the system.* Loss of weight may markedly aggravate this condition, but the potentialities are usually present before this has occurred.

In many instances individuals who have frankly prolapsed organs show few or no clinical symptoms until they have exhausted their nervous reserve, and then the illness follows, when and where depending entirely on those portions of the anatomy which are most likely to yield. Almost always there is one of four causes responsible for the onset of symptoms. In order of their frequency, the first is infection, and infection and the exhaustion consequent to systemic toxemia result in a syndrome which the clinician in his analysis finally focuses on gastroenteroptosis. This infection may be an acute disease, as the infectious fevers; it may be any one of the multitude of focal infections affecting any or all of the organs of the body. The second cause is nervous exhaustion from overwork, anxiety, fatigue, and the thousand and one nerve depleting circumstances which attend modern life. Any one of these if sufficiently cumulative will result in the eventual breakdown. The third is loss of weight, frequently due to the preceding cause, likewise due to many of the intestinal disturbances as well as improperly balanced dietaries. Finally, as a fourth cause I am certainly inclined to view some of the mechanical theories of Lane with intestinal stasis as the primary focus.

Let the condition which calls the physician's attention to the visceroptotic condition of the abdomen come from any one or all of the above sources, its début may be announced in just as many ways. One individual will appear with a complete nervous breakdown, the popular "nervous prostration"; another will appear with alarming anginoid symptoms in the epigastrium and under the manubrium, symptoms which are due to alterations in the irritability of the vagus and to air swallowing, aerophagia; another will develop pronounced anorexia; another even nausea and vomiting. All of them, however, have marked autonomic disturbances. Still another class will show attacks of mucomembranous colitis, and constipation alternating with diarrhea. Not a few from the alarming character of the subjective symptoms will interest the surgeon, and I have frequently seen spastic constipation and an overloaded colon taken for appendicitis.

Not rarely the patient was so impressed with the urgency of his symptoms, coupled with the confirmative proof of surgeons whose diagnostic possibilities in the abdomen are limited to appendicitis, cholelithiasis, and gastric ulcer, that only operation would satisfy the patient. I have had my share of cases of ptosis which were operated on purely for that condition. At present under treatment I have four cases of gastroenteroptosis, in all of which the stomach was sewed up only to fall again, and in all there is ptosis of the bowel. In three ptosis of the right and in two ptosis of both kidneys is present; in all the disease is as marked in the eyes as it is in the intestine, and in none was the relief permanent. These four are under treatment at the present time, but I have had many more. This is also true of Mr. Lane's cases. I saw a number in Europe; I have seen some here, but they are becoming less each day, and never have I seen a real success when the measure of success was a permanent result. How can surgery remove serum changes, alterations in smooth muscle tone, alterations in the mineral content of the

blood and unstable vasomotor and autonomic nerves? The true clinician was he who said that to medically cure these constitutional cases of ptosis, one must start with the third and fourth generation preceding. The surgeon cannot cut out the ancestry, nor can he remove its indelible traces. He can splice, short-circuit, mechanically rearrange, and what he has done so marvelously in those spheres needs no commentary from me; but the sphere of gastroenteroptosis is a truly medical one, worthy of the best efforts of the patient and painstaking physician.

Apart from the definite medical indications of gastroenteroptosis, there are several points of the greatest importance which have helped me very much in the solution of these problems. The incidence of infection is one. One of the commonest associations of ptosis is infection. Oral surgery finds pyorrhea, or in many instances infected tonsils, and nearly all these cases complain of postnasal and pharyngeal catarrh. Recently I have cultured every case in my office, and in nearly all have had the teeth *x*-rayed. I am not a faddist, but in nearly all fads there is a grain of truth, and we cannot neglect the precaution of possible benefit arising from the demonstration of possible infection. As a master surgeon believes in the removal of all infected appendices, so I believe in the removal of nearly all frankly infected teeth. I do not know why I find so many postnasal and tonsillar cultures which are pure cultures of streptococci and staphylococci, but if the surgeon obtained them he would cut the organ out, and in all the bad cases I have a vaccine prepared. Whether it does good I know not, but there are other sources of infection: colon bacilluria is alarmingly frequent with these cases, and the colon bacillus and even the streptococcus are frequently isolated from the bile. I am at present preparing figures on the frequency of this association. A chain of enlarged cervical glands frequently attests to infected tonsils apart from the cultural findings, and the beneficial effects of removal of tonsils in many but not all instances proves that it was the condition in these ptotic cases which induced the symptoms.

Another important infection is pulmonary tuberculosis. Many of the individuals who have ptosis are tuberculosis suspects. In many there are alterations in breathing, in percussion note, and in breath sounds. Of late I have fluoroscoped a number, and the frequency of peribronchial thickening and clouded apices with a total absence of the subjective symptoms referable to the lungs simply emphasizes the association. The other day I fluoroscoped a man who showed almost complete fibroid tuberculosis of the whole upper right lobe, who never had a clinical sign of the condition. All of you can recall such instances. He was sent to me for ptosis, but he had ptosis plus the other condition. These people on careful examination show closed lesions, and when the lesions are not active the gastrointestinal phenomena overshadow the pulmonary findings. Scarcely a day passes that I do not find a ptosis case with signs physically or fluoroscopically of some pulmonary involvement. I am tempted at times to consider one as the necessary complement of the other. It is simply one more cry for hypernutrition and rest.

The frequency of disturbances of the vagus and sympathetic system is important. To describe the symptoms of ptosis is to describe autonomic ataxia or a disturbance of the visceral nervous system. All of these are associated with nervous disturbances, and in some the vagus or vagotonia predominates, and in others the sympathetic tonus predominates. The essential point is not the importance of the one or the other, for they rarely occur as pure syndromes, but the important point is the *essential instability of the visceral nervous system*. The discomfort, heartburn, nausea are variously described as due to atony, mild reversed peristalsis, and alterations in the vagus tonus. The anginoid pains with aerophagia belong to the same category. The constipation with spasm of the sigmoid, the cecal and ascending retention, are

again essential disturbances in bowel innervation. But with these in many instances are the Cohen nails, the vasomotor disturbances, the irregularities in pulse and respiration, and the series of symptoms which clinicians have described as characteristic of this state.

Finally we must consider the frequency of intestinal stasis. In almost all cases of ptosis there is intestinal stasis. With the exception of the looseness of the bowels, seen in certain thyroid and intestinal disturbances, constipation, particularly of the spastic type, predominates. The picture most frequently is spasm of the sigmoid with prolapse of and dilatation of the cecum and ascending colon. The stasis is located primarily in the duodenum, the terminal ileum, cecum, and ascending colon. Another form is so-called fragmentary constipation, in which in spite of daily evacuations the bowel is not completely evacuated. By means of high double irrigation of the colon is is readily possible to demonstrate in these cases the high retention with all its serious consequences. It was Alvarez who pointed out the great danger of mild reversed peristalsis from this source, with its eventual trouble in the stomach, with distention, discomfort, nausea, and, even in the mouth, the coated tongue and bad taste.

Lane's conception of acquired prolapse of the cecum and ascending bowel, with stasis and kinking of the ileum, and the treatment of this condition by the so-called "freeing of the ilial effluent," is as interesting a piece of work as has been brought forward, and the logic of his plea is at times irresistible, but one always feels that underneath it all is the question of the nature of the individual and the quality of the muscle fiber.

Regarding the diagnosis of these cases. It is easy by the aid of the *x*-ray, and the trained clinician can usually distinguish the earmarks from physical examination of the abdomen. In most of these cases the cecum and ascending colon are palpable as well as the sigmoid and descending colon, and not infrequently by aiding the relaxed abdominal wall over the viscera it is possible in the thin subject to make out the traverse colon. Inflation of the stomach readily enables us to make out its outlines. Long practice and correlating screen findings with physical findings will enable the trained observer to determine these conditions.

Before discussing the treatment of this condition I wish briefly to allude to the frequency with which there is poor handling of fats. Whether this is due to a pancreatic and biliary involvement or lack of intestinal absorption is not clear. I am convinced of one thing, however, and this is as true of ptosis as it is of pulmonary tuberculosis, and that is that these patients do not handle fats well, and fecal analysis rarely discloses the presence of starches undigested. There may or may not be intestinal putrefaction and imperfect handling of proteins, but almost always the digestion of the carbohydrates is intact, which is an important therapeutic point.

I have said that gastroenteroptosis was a medical condition. What then are the indications? I should say two series of indications—first, those which have to do with all those constitutional agencies finally inducing all those symptoms. They might be enumerated as follows:

1. Restore nervous tone.
2. Increase weight.
3. Eliminate infection.
4. Tone up the system.

These might be described as follows: Nervous tone is best established by nervous rest, and nervous rest is most completely obtained if the patient is put flat on his back. In no case should such a treatment be less than four weeks. The pulse-rate subsides, the circulation improves, the jerky muscles are subdued, but in many cases sedatives such as the bromides are absolutely essential to enforce, medically, relaxation. A patient deriving the proper benefit from such medical treatment should be completely relaxed at the end of the first week; if this does not occur it must

be brought about by drugs. After the second week tonics, such as iron and arsenic hypodermically and the sodium cacodylate so much admired by Chauffard, can be used in this way. All the agencies of hydrotherapeutics and massage have their proper application at this point, and the wise physician will neglect none of these adjuvants toward improvement.

(II) To increase weight, I follow one definite rule: I give every case an intestinal test diet somewhat on the order of the Schmidt diet, and find out as nearly as possible what he can handle. I then cut out what he cannot handle and increase the foods which he does handle, and nearly always the starches are well handled and give rise to no intestinal putrefaction. I am inclined to believe that the benefits of the Coombe treatment were due to this principle. Then I push the feedings to 3100, 3200, 3300 calories, until I register a result, and keep hammering away. The nurse here is an important factor, and the doctor must be somewhat of a psychologist. Infection is eliminated by removal of infected teeth or tonsils and by the administration of proper vaccine prepared from the tonsil, postnasal space, and gingival margins. In every bad case I insist upon obtaining these organisms which occur in pure culture and are of the pathogenic variety.

Systemic toning up is accomplished as mentioned above. In every case I irrigate the bowel in order to determine whether irrigation is necessary.

Finally the second group of treatments is directed toward the organs themselves. Time and time again I have been asked what form of support I used on the abdomen. My response was always the same: I use no one form of abdominal support. In every case I study the configuration and the position of the organs to arrive at some form of support which offers relief. I have used everything from the inflated rubber French supports to the whole gamut of corsets. I think there is not one made near Philadelphia which I have not tried. In France I studied fluoroscopically various supports, and I am sure that in certain instances, in spite of the statement to the contrary of certain clinicians, we can get elevation of viscera. It seems to me, however, that the benefit is not so much due to the elevation of viscera as to elevation of intra-abdominal tone, and the more I ponder on this problem the more I am convinced of the truthfulness of this assertion. When one realizes that not only is there relaxation of the viscera but relaxation of the great venous radicles, it is evident that there must be general circulation relief. In nearly all cases I try out a moleskin plaster and place a pad in the corset, which is always of the straight-front variety, and strong pieces of belting with buckles to fasten them tightly. Rarely have I used these strong spring supports, which resemble a truss more than anything else.

Suggestion is a most valuable factor in the treatment of these cases, and they are above all else detail cases. In each case by attention to minor details of the nose, throat, sinuses, digestion, one will be amply repaid. One friend of mine has taken up for his lifework the treatment of the chronic intestinal invalids, and his slogan is to teach them how to live. He gets results, and so will any one else. Some one must take up this work, and the sooner we give up this neurasthenic idea and apply ourselves to a painstaking analysis of the factors making up these cases, the better will be our results and the greater our satisfaction. No physician ever lived in whom the satisfaction of relieving the patient did not outweigh every other consideration. Serology, bacteriology, chemistry, all find a fertile field for investigation in this line.

I might harp on the question of hydrotherapeutics, but the important points, it seems to me, are those I have enumerated. These cases are everywhere; these individuals are in many instances inordinately sensitive, high tempered, temperamental; they are in many instances the artists, dreamers, and not infrequently the doers

of the world, and their contribution has been great; therefore it is up to us to solve their problem.

Glenard of Vichy only recently has promulgated a series of positions and exercises of considerable benefit; and how many drift into the hands of the irregular schools of medicine, where details and psychology of the patient are exaggerated out of all proportion to their true status, suggestions being made which in these receptive subjects find ready soil. It is our fault if such be the case, because all these methods are as readily ours as theirs, while we are fortunate enough to possess an amount of information which enables us to do much if we wish to bring all the forces of modern medicine to bear on this problem.

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## CHRONIC COLITIS: TYPES, CAUSES, DIAGNOSIS, AND TREATMENT.[1]

BY DR. ANTHONY BASSLER, NEW YORK,

Professor, Gastroenterology, Fordham University Medical College and New York Polyclinic Medical School and Hospital; Consulting Gastroenterologist, Peoples, Polyclinic, Beth-David, Christ's Hospitals, etc., etc.

*Mr. President, Ladies and Gentlemen:*

I must beg your indulgence because the remarks I have to make may seem rather disconnected. I can remember when I was interested in the work of Christian Herter, that when it was finished it was merely a series of disconnected things, and I said to Herter at the time that I doubted if any one could get any point or sense in the whole book. Thus it seems rather characteristic of this subject that it is difficult to present it in any chronological way. Now chronic colitis, as you all know, has been written upon for a good many years, unfortunately not in our best medical journals, but in such things as "Medical Backwoods" and such different sorts that come to us mostly as advertising mediums of proprietary remedies, and when one takes all the literature that has been written on the subject of chronic colitis and studies it with the idea of getting something worth while in the finish of it, there is really nothing left worth reading, excepting perhaps the title "Chronic Colitis."

Now as you know, chronic colitis is divided into the hypertrophic and atrophic forms. The hypertrophic form exists in the pathology of the mucous membrane as swollen, reddish, moist, and usually it is found in non-constipated cases; the atrophic in the thinned-out, shining looking membrane in which there seems to be, and histologically is proven to be, a loss of the glandular elements in the mucosa, and this is usually found in the constipated case. This classification is well known. I will add to-night the ulcerative type because there are a great many ulcerative conditions, chronic in nature, not due to tuberculosis, syphilis, or any of the dysenteric organisms.

A clinician must oftentimes wonder why it is that he sees cases of so-called ulcerative colitis, classified as follicular, or however you please, in which usually there are superficial ulcers. Commonly there is a denudation of large areas of mucosa of the superficial layer, and after searching for amebæ and throwing out of consideration tuberculosis and syphilis, and not finding any definite dysenteric organisms of Flexner or other types, one asks just what is that pathology due to. At the conclusion of considerable amounts of work in these cases I have come to the belief that organisms, mainly those of the coli-dysenteric-typhoid group, Gram-negative organisms, can become pathogenic in the gut whether because of diminution of local resistance, increase of general susceptibility, or some pathogenicity that would or might be looked upon by the ordinary laboratory

[1]Address delivered before the Philadelphia Clinical Association, November 3, 1919, at Thomson Hall, College of Physicians, Philadelphia, Pa.

procedures as an innocent form of organism, which nevertheless through animal experimentation proves that it is pathogenic in type. Of these organisms I will speak later.

Chronic colitis is a very common affection, and we all of us have had numerous instances of it in our practice, and in a gastrointestinal practice, such as mine is, I find what might be considered as a condition of chronic colitis in one of every three cases that I see. Ofttimes it is true that the symptomatology the patient comes in with does not hang about a chronic colitic condition, but more or less degree of what might be termed a chronic colitis is present in one out of every three cases.

The etiology of chronic colitis is a very interesting thing to study. We have recognized and believed for a long time that chronic colitis is essentially a neurological condition, and certainly it is true that in a great many cases what might be termed chronic colitis is found in neuropathic individuals. Ofttimes to decide whether the neurological condition is secondary to the colitic condition, or the other way, is very difficult, but as the years have gone on, and particularly in the study of different individuals with the same colitic condition who are known to have neurological symptoms, I have come to the belief that while the brain and nervous system are closely associated with the colon, it is not proper to consider chronic colitis as a neurological condition, but that the etiology must be sought for elsewhere.

Now I am not going into a description of all the things that Mr. Lane has written on. I believe very firmly with your celebrated surgeon in this town—celebrated just as much in New York City—Dr. John B. Deaver, when he said in one of those rare statements of his that the destinies of the individual or the nation are not changed by changing the fecal stream; and I happen to be in a position in an institution in which Lane operated the first time in this country and then again, and there rapidly came about some enthusiastic surgeons who were so badly bitten by the Lane propaganda that they went on resecting and anastomosing in all sorts of abdominal plumbing, until finally there accumulated—and John Hopkins itself was not free from this—enough cases in the city of New York to make one feel that the moral effect of the operation very often did not last much longer than a year. Some of them seemed to go bad long before that.

What Lane did do was to detail a description of what in the scientific family of scientific men is called an intestinal toxemia and never an autointoxication. Also he described a group of symptoms, which, while I do not agree with cystic degeneration of the ovaries and many other things, such as hyperthyroidism, etc., being due to a toxic condition, I am satisfied that he has described the symptomatology of the chronic toxic case the best of any that I know of.

Considering cases coming in with gastric symptoms, I find that at least 41 per cent are instances of symptoms due to intestinal conditions and not primarily to any errors in the stomach itself. Of such most numerous are the so-called hyperacidity cases. I do not think that one is warranted to make a diagnosis of gastric hyperacidity quickly. It is done far too quickly by even men in the same work that I am engaged in. It is in my opinion one of the most difficult diagnoses to make accurately, as far as I can tell from anything that you can prove dispassionately. Hyperacidity as a functional condition of the stomach is more rare than supposed, although the symptoms of pyrosis, acid regurgitation, relief by alkali or the taking of food, and so on, are quite common. The same may be said of hypersecretions—that is, continued secretion in the stomach. Why so many cases of chronic colitis have this symptomatic condition explains why it is that in attacking the stomach condition in the usual way (not paying attention to the colitic condition) such poor permanent results have been accomplished in the treatment of hypersecretion.

Atony of the stomach is also a rare condition. By atony I mean primary atony (not secondary to any obstruction), where the stomach does not fit down tightly enough upon a bolus of food. Only by careful functional studies and a very careful study of the depth and number of peristaltic waves in addition to the diameters of the stomach as an organ is the diagnosis of atony justifiable. I believe that certain toxic intestinal conditions are the most responsible for atonies in whatever section of the gastrointestinal canal they are met with. It may be in the cecum or ascending colon and not in the stomach, it may be in the entire colon, and sometimes in the asthenic case it may be rather general throughout the gastrointestinal canal. I have by a careful staining of the sympathetic structures in the abdomen been struck with the fact that in certain toxic intestinal conditions a granular degeneration of the sympathetic fibers, even including the sympathetic ganglia, can take place with a shrinking of the ganglia, and as you know the sympathetic system is an inhibitory system, that would explain atony and dilatation. In these instances you have atony and dilatation because the battery and wires to the organs are diseased and thus deficient in function.

About 12 per cent of these colitic-toxic cases have gall-bladder pathology. I do not think that all gall-bladder pathology is accomplished by an ascending infection or because of the presence of bacteria in the portal circulation and their elimination by the liver, and, coming out in the bile radicles, accumulating in the gall-gladder, which as you know is a reservoir to hold more or less bile in the interval between the meals. I believe that there also are instances of bacteria from the intestinal canal gaining the general circulation and flowing away from the portal circulation in the abdomen, and in this way also can bring about the infection of the gall-bladder, and with stenoses and disturbances interfering with the emptying of the biliary bladder eventually bring about a pathology. I do not believe that hypercholesteremia, so called, is responsible in an etiological way completely for cholelithiasis, but rather that infection, originally from the gut, is responsible in all instances, although I am satisfied that certain people who are constantly hyperglycemic are seemingly more prone to the development of stones in the gall-bladder than those who are not so. One must often have seen cases of gall-bladder conditions that were operated upon, most commonly that of cholecystotomy, in which after a length of time, perhaps some two or three years, symptoms come on closely resembling the original condition for which the patient was operated upon, and I suppose you are like most of us and say, "Well, there are probably adhesions there, postoperative adhesions." I have had a number of these individuals opened the second time and found no adhesions worthy of mention, and that led me to a study of association between a chronic colitic condition and such cases, and I find in most every instance of such a return case that there is a gut condition that is abnormal and that this gut condition is bringing about certain symptoms which so closely resemble the original gall-bladder symptoms that at times you could not differentiate between them. I have seen several such cases which have been operated upon in the Mayo Clinic and elsewhere by good men, and been pleased to find after they were attended to in ways that I mention they became symptoms free.

The same is true of appendix cases. I am satisfied that generally throughout medicine the diagnosis of chronic appendicitis and the performing of a primary appendectomy and promise to the patient of relief of symptoms is far more common than it should be. I am satisfied that the diagnosis of chronic appendicitis in a well studied out case is not difficult. I am of the belief that when one has had sufficient experience with these cases that one becomes very sharp—Dr. Deaver, for in-

stance—in being able to tell at least that the case is not one that requires a primary appendectomy for benefit. I have seen a few such cases that have passed through Deaver's hands that have proved to be as he judged them. Now one sees many cases in which the appendix has been removed and the symptoms are still there, and you may argue that a tuck should have been taken in the cecum, or it should have been attached to the anterior wall, or this or that should have been done in addition, and sometimes these things are done, and yet the symptoms are still there. The reason they are there is because the condition which produces most commonly an appendix pathology, namely, an infection of the gut contents, is not removed by the operation, and symptoms again come on which closely resemble the condition for which the operation was originally done, and sometimes in such instances it is judged rather unfortunate that a gall-bladder was taken out, or an appendix was taken out, and there is nothing more surgical to do. This is because men do not seem to know about diseased gut conditions, and therefore the reason I have picked this subject for you to-night.

In the abdominal symptoms of gas, distress in the abdomen, you all know (we are speaking now of chronic toxic conditions). I find one thing not uncommon, a stiffness in the gut, most often in the descending colon, sometimes in the transverse and perhaps in the ascending colon and cecum, not due to ballooning but a fixed stiffness in the gut. Tympanites is commonly present in a chronic colitic case, and tenderness in the cecal region, found perhaps in 10 per cent of the instances. Thus the right colon may become quite tender, and it is difficult for some men to differentiate as to whether it is due to a condition such as I have described, or to an appendix that should come out.

I believe that ptosis can be produced, or rather that the symptomatology can be produced, by these toxic gut conditions. I am satisfied that ptosis is commonly congenital and often follows in women who have had children, although I have seen women with a low stomach who have had a dozen children and had no symptoms. A year or so ago I did some work in connection with the toxic gut cases and ptosis in which the statistics showed, if my recollection serves me right, that out of 500 cases there were 249 in which there was a distinct biologic change in the intestinal canal, and that these 50 per cent were primary infections of the intestinal contents. I think about 25 per cent were toxemias secondary to stasis, general conditions, etc.

Now I am satisfied that a woman who has ptosis and toxemia in addition, whether because of the secondary disturbance in the neurological condition of the abdomen, whether because of certain atonies or disturbance of function which bring about symptoms, that such a woman, or such a person, while they could improve under treatment for the ptosis, whether medical or surgical—and it should be medical most of the time—their improvement generally will not be sustained so as to remain symptoms free, and they are liable to return after six months or a year with the same complaints that they came for originally.

These are intestinal cases which if they were cleaned up in the biochemistry of the gut would remain symptoms free and have far better what might be termed compensation in the digestive canal. I believe, by not producing such symptoms as one sees in a decompensated heart, but subjective symptoms that the patient describes in the abdomen, and objective symptoms in the way of general state of health, that these are nevertheless due to a decompensated digestion.

My first experience in a skin test way was a case that was sent to me for some disturbance in the abdomen, which was under the charge of a dermatologist, and I rather interested myself in studying skin disorders and reactions in toxic cases after that. In following this for years I have never seen

a hyperthyroid condition in any association with an intestinal toxemia, although Lane believes otherwise. I commonly see cases of suprarenal deficiency. If one studies the Sargent white line and so on, and hypotension in the suprarenal deficiency case with the use of the dynamometer, making readings 30 minutes, one hour, one hour and a half, and then giving that individual adrenalin hypodermically and then making readings again, one can best judge what can be termed the true suprarenal case. Oftimes without giving any suprarenal substance, simply treating the intestinal conditions, it has been my observation that these cases get well. Undoubtedly these intestinal conditions can bring about deficiency in the suprarenal function.

We know that sulphuretted hydrogen is a common gas in the intestinal canal, and we know that it is soluble in water. You have all opened a bottle of sulphuretted hydrogen in your laboratory days—a solution of gas and water—and we know, further, that sulphuretted hydrogen when resorbed into the body causes reduction of hemoglobin and erythrocytes. In my cases without the exhibition of iron or other means to buck up the general state of health, it has not been uncommon to see long-standing simple anemic conditions get well. We know so little about the etiology of the other blood dyscrasias that my interest was stimulated in a case of pernicious anemia that was treated by one of my assistants by transintestinal lavage with a hypertonic solution. It had a marvelous effect upon the blood picture of the patient. I then began to study some of these cases. I think there are nine up to this time. I found that all but one had a most strange bacteriology of the gut, namely, large numbers of the so-called Bacillus putrificus, a denizen of the normal intestinal canal, but never met with in any such large numbers as were encountered. They were treated (in addition to the other things that were done) by this lavage, and in these pernicious anemia cases there were striking results in all but two, both of which were extreme cases in which apparently no benefit could be brought about.

I saw a man from a well-known dermatologist, who sent him in for stomach symptoms, who had had chronic eczema for twenty-four years. When we had worked him out he had a chronic intestinal condition, which got better, and then his chronic eczema disappeared. There has been since some score or more of such cases. Of course I never say anything about what effect the treatment will have upon the skin condition because that would not be fair, and perhaps most unwise, but it is interesting in some cases of marked eczema, and certainly most all those of recurrent urticaria, that these seem to be due to colitic conditions of a chronic nature, commonly existing in the individual without producing any symptoms in the abdomen. The same is true of acne. I do not mean the infectious types of acne, as acne vulgaris; I mean the simple forms, particularly in those in the twenties.

A man with diplopia was sent to me for treatment of a stomach condition. When he had gotten better of his intestinal condition his diplopia disappeared, it having been so distressing that he could not continue at his work any more. That awakened my interest in an association with functional eye conditions, and I accumulated several cases of diplopia. From that I went to working with the different colored yarns, and I find that ever so many more people are color blind than know about it, and I think that color blindness, which is often functional, is due to these toxic chemical conditions of the intestinal canal.

One sees commonly in the spring of the year cases of so-called hypertrophic rhinitis. We all have them in our practice. I used to feel that it was due to the individual being housed in the winter and breathing superheated air and getting extreme changes of temperature on going out into the cold, not getting enough fresh

foods, and so on, and I let it go at that. I now believe that chronic hypertrophic rhinitis is a symptomatic condition of a chronic gut disorder, and the reason these nose conditions appear in the spring most commonly is, not because they do not go out enough and do not get the right sort of foods, but because living that way through the winter their vital conditions have run down enough so that the toxic gut condition gets the upper hand and swells the nasal mucosa. It is very interesting to observe these cases of chronic hypertrophic rhinitis, and see their nose condition entirely disappear. Very interesting! Now I would ask if any one can tell me what is the etiological cause of what in the old classification we termed essential asthma, and in some of these cases in which, following a bronchitis, generally in the fall, there comes on a bronchial asthma, with perhaps another more or less asthmatic attack late in the winter, and then perhaps later on in life some degree of emphysema in the lungs. I have seen five or six cases of essential asthma among those who have been treated, and they have all gotten well. They have had no return of the asthma.

When one in the paroxysmal attack of tachycardia can say that there is a degeneration in the left auricle responsible for the tachycardial attacks, we have enough to go on to explain the condition. I have seen cases of distinct tachycardia, however, which might be termed neurological which have gotten well of the tachycardial paroxysms. It often comes to the question in some of these as to whether in definitely diseased left auricles and long-persistent tachycardia the process producing the degenerated small islands in the auricle were not originally brought about by some condition such as I have mentioned. While none that have had a long-standing history of tachycardia have been benefited, we have believed that in these they had definite myocardial change, yet not a few that may be considered functional with distinctive symptoms have gotten symptoms free. The same is true of what I might term functional cardiac palpitation cases. I believe now that chronic gut conditions can bring on pathology in the mural substance of the heart and can bring on pathology of the liver and in the kidneys, as well as in the general arterial system, mainly in the intermediate sized branches of the arteries. I cannot go so far as to say that all cases of chronic myocarditis, chronic hepatitis or nephritis, or arteriosclerosis are due to intestinal canditions, because rheumatism, syphilis, and other infectious and toxic causes cannot be excluded; but I will go so far as to say that one meets with these intestinal conditions in toxic gut cases uniformly, and it is not uncommon to see in not too far advanced cases a most marked benefit come about by treatment of the intestinal condition alone.

A rather celebrated neurologist—I know Dr. Dercum will seize upon me for what I am going to say—but, nevertheless, a celebrated neurologist in my office said or asked me the question a long while ago, "How many cases of so-called neurasthenia —which I understand now belongs to the category of anxiety or fatigue neuroses—how many cases of neurasthenia in people who were unable to do anything but go into sanitariums have you seen among these intestinal cases?" I believe that I had seen a lot of them, and I turned to my secretary and asked her what proportion she thought of these people had been in sanitaria for treatment for so-called nervous prostration, and she said, "Oh, I think at least one out of three." Well, I could not believe that, and we took the trouble to go back in a thousand records, and it was one out of three in the female and one out of seven in the male. Now without giving you any statistics, I want to say that I believe these intestinal conditions are responsible for whatever this is that is often called neurasthenia—at any rate that lands individuals in sanitaria, etc., unable to accomplish much by the usual methods of treatment. Individuals who had been treated

in these ways have gotten well and have not had to go to these places again. They have been in the hundreds, and it must be that there is an association between intestinal conditions and this status of the nervous system.

Regarding the recurring headaches commonly met with, lack of endurance described by individuals as not able to stand up to the job, unable to do as they used to do, women lying around unable to do a fair day's work and so on, insomnia in the 41 per cent of cases, chronic myalgia—what I mean by chronic myalgia is recurring lumbago, arthritis deformans in 31 cases with 29 distinct improvements, all these are suggestive. I believe that whatever to the contrary may be said by Dr. Ralph Pemberton, or anybody else, these chronic intestinal conditions are largely responsible for many cases of so-called arthritis deformans, whether it be of the atrophic or the hypertrophic type. It is a remarkable thing to see a case, as I have seen, that has been bedridden for three or four years, by simple diet and vaccines in six months or a year, come alone to New York City and go back to her high school, teach French, never have recurrence in any of the joints, and be teaching French all the way through for seven straight years. Now that is the instance of my first case of arthritis deformans, and there have been enough of them since then to satisfy me that it is not only teeth, tonsils, sinusitis, and so on, that is a cause in this condition, but that the colon should be looked upon as a focus of infection as well, because it is my belief that the colon should be held largely responsible for the majority of these cases.

Now I cannot go on in a clinical way; I think I have said enough. I will finish on the clinical side by saying that it is almost as if in every department of medicine there are instances of something, to some extent anyway, conditions that are due to toxic gut conditions, conditions that come to a specialist whether it be for skin, nose, orthopedic surgery, neurological conditions, or what not, in which the colon must be considered as a part of the body in an etiological way.

The diagnosis of these conditions in my belief is accomplished about as follows: Without paying any attention to the history, without having any assumptions, the individual should be placed upon a diet suitable for the age and work that the individual does, about like that of the Schmidt and Strausberger No. 2 in constituents, but more easy to carry out in the home. Such diet may be easily made up by the use of gruel in the morning; some milk in the mid-morning; beefsteak, potato and bread at noon-time; some milk about 4 P.M.; and repeating the breakfast at dinner-time. The individual is kept on the diet for 72 hours; it takes from 36 to 48 hours for food to traverse the intestinal canal in the majority of individuals. Then such stool or urine specimens that are sent represent the diet that the individual is on. That diet you know is about a normal one, and such specimens should come through the laboratory procedures negative. Now the stool: I want to speak for a few minutes on this. The stool is examined for ova and all of the usual things, and I will merely mention the special points in connection with the examination of stool and urine in this connection. In the so-called saccharobutyric cases the stool is of a light specific gravity, fluffy, acid in reaction, and generally of a greenish-yellowish color. The stools of the so-called indolic cases are usually dark in color, sink in water, specific gravity high from condensation, and have an alkaline reaction. I may mention that the color of the normal stool is seal-brown, is stiff enough to keep its shape at least in its first part, is neutral in reaction, and as you see that the two abnormal stools that I have described are different from the normal, suggestions are derived. We pay very little attention to food particles as such, although we do pay some attention to the presence of crystals, not so much to the triple phosphates as to the ammonio-magnesium phosphate, the uritic and oxalate crystals.

Getting through that, a small portion is

spread upon a slide and a Gram differential stain is made. The bacteria are counted the same as white blood cells and the Gram-negatives and Gram-positives compared. I have come to the conclusion that about one-third Gram-positives to the Gram-negatives is essentially normal. If up to this time there have been some suggestions we take 5 grammes of solid stool, 7½ of the mushy, or 10 of the fluid; we separate the bacteria from the food detritus by centrifuging with alcohol and water and dry weigh the bacterial content; the bacterial content should not be over about 30 per cent in a normal stool; it may run as high as 87 per cent. Then certain portions of stool, to go into detail, is mixed with water, put into tubes, and fermented, and an estimation made of the quantity of gas, and then of the character of the gases, as to whether they are acid or alkaline, due to fermentation or putrefaction, and then whether there is sulphureted hydrogen and marsh gas and so on. We then inoculate a 2-per-cent dextrose bouillon anaerobically and aerobically study the sedimentary fields that are grown. Where any doubt exists, animal inoculation is also done, mainly to study the pathogenicity of organisms of the colon group.

I want to say that whatever has been said on the subject of there being no importance to this bacterial matter in the stools, or whatever has been said on this whole subject of change of bacteriology by diet and so on (which latter is true, for you can change it for a short time; most of the intestinal bacteria, however, are facultative and eventually will grow on a diet diametrically opposed to what you suppose indicated), whatever has been said in that there is not much or anything to it, I have come to a directly opposite conclusion, even against an article in the *Journal of the American Medical Association* of last week; it is true that if you will work with the stools and urines as a student in this subject you will see the most diverse conditions from normal, and you will see in these diverse conditions that you can make etiological associations with various conditions and disorders that belie all the negative literature that there has been.

Then the urine: For the regular examination we pay little attention to the presence of indican, except as a suggestion, or the amount of indican, but we go promptly into a sulphate partition. We separate the preformed from the conjugate sulphates and estimate the conjugate sulphate body. We estimate also the uric acid content as well as the oxalic acid content when there is a suggestion in many oxalic crystals. Of course all that pertains to routine examination of urine is done in advance.

Then a proctoscopic examination is made, and no diagnosis of so-called chronic colitis should ever be made until you can see in the gut with your naked eye that a pathology is present, because chronic colitic conditions will always show in the upper rectal mucosa and you can always see visually that far. I do not believe it is proper to make a diagnosis of chronic colitis in an individual who has not been feeling well and who tells you she has a large amount of mucus in stools. It is not enough. You must see some kind of pathology on proctoscopic examination. *X*-ray examination is made as a routine in dilatations of gastrointestinal canal, etc.

Now I want to criticize the commonly employed treatments a little bit, such treatments as there have been, and then I want to present what has been of interest to me for a long time.

I am satisfied in these cases that all that pertains to hygiene, baths, sojourn in the country and so on is beneficial, although they are not curative in what might be termed a cure in dispassionate judgment—that is, judging a case from the laboratory side. I hold a very severe brief against all forms of purgation as a method of treatment. I have never seen a case of chronic colitis benefited in any way, and if the purgation is kept up long enough it becomes distinctly worse. It brings about certain congestive conditions in the intestinal canal with increased resorption of the intestinal content, with intensification of the symptoms, although the patient

may feel somewhat better for a day or so. Russian oil, such as Lane advocates, is worth while because I have taken some of these cases and fed them large amounts of oil so that it floats over the fecal contents. When they pass Russian oil without a stool as a rule it is because you have given too much of it, and I have examined such oil that has come away and find that the oil does possess some affinity for certain toxic bodies of an alkaloidal and colloidal nature, and certainly it would seem to be beneficial from that standpoint, although not basically curative. The salines are perhaps the least harmful of the purgative measures, but they are not curative. Castor oil once a week or so to clear out the intestinal canal is of benefit, but the so-called castor-oil method of treating chronic colitis—and when I say colitis I am speaking of infectious conditions of the gut contents—is not curative. I have never yet seen a case, and we have in New York several men who have this continuous castor-oil method of treating colitic conditions; I have never observed other than that these patients go on fairly well during the time they are taking it, and after a bit are just as they were before. Drugs I am not at all a believer in. I am speaking of aloes and so on in continued doses. I believe that many of the pathologies of the gut of the simple types I see are brought on by the intemperate use of purgation methods of that kind. I do not believe that it is possible ever to cure a chronic colitic infectious condition of the gut unless you can accomplish normal movements by diet. When I was in general practice I had all kinds of purgative pills and tablets, and I thought they were about the best in my armamentarium. Now that my practice is all gastrointestinal there is not a purgative pill in the house, and I never write for one; and it may be concluded in a very significant way that in the individual who by careful diet you cannot get the bowels to move in a normal or sufficient way has something wrong in the intestinal canal that requires surgery, and that it is not due to toxemia in the gut or bad habits—I am not speaking of what may be necessary to do, iliac implantations, or anything of that kind—but that there is something there that only a surgeon can benefit. I want further to say that in the course of a year in the many instances that I write diets for constipation cases there are not more than two or three of such cases in a constipated army whose bowels I do not get to move by diet. This is by the means that you know of, and you may argue that you can't get individuals to do these things, that they would rather take a pill; but I want to tell you that they will do it if you insist upon it, and I will not permit them to take anything in the drug line.

Intestinal disinfectants I have nothing favorable to say about. None of them are any good—salol, naphthalin, and all the rest. There is benefit in some cases from small doses of calomel, but that is very limited.

Irrigation: Now it is the fashion all through the land when anybody has anything wrong of this sort to irrigate him, and yet I have not irrigated a case up to the present time. I do not believe in irrigation methods of treating chronic colitis or any form of chronic intestinal diseases. As a method of treatment it is all a mistake, because while they may get better, they do not get well. There is some benefit in the very congested colon in the use of instillations of 5-per-cent gelatin solution, such as was suggested by Dr. D. Roberts, of Brooklyn. I do not know why other than its being sedative, and there is some little benefit in that in some instances.

The diet in these intestinal conditions is arranged according to the bacteriology that is present. In the putrefactive cases we use a carbohydrate-lactiferous diet. In the fermentative cases we use a strictly protein diet, almost, if you wish, the old Salisbury diet of beefsteak and water, although generally I allow in addition to that, chicken, fish, eggs, and beans. Here you see is an inconsistency according to present

belief of attacking an intestinal condition, and there are men who say that you need nothing but low or absence of protein diet; still the fact is that you cannot control a fermentative case early except by the use of a high protein content in the canal. That is about as far as you can go in a dietetic way, and yet by these two diets you do not get the cases sufficiently well, even though the bowels have moved daily. You must also consider it as an infective condition and add to them certain bacterial treatments that I will mention. People come to me with bottles of B.B. cultures in grips and pockets, and tell me they have been taking the milk for a long time. Some of them say they have gotten benefit; most of them have not. Some have had B.B. cultures made at the Rockefeller Institute to be sure that it was right. These with the B. acidiphilus are of some benefit in the acid gut, but only in a moderate way, and only for a short time. An intestinal toxic condition is often a putrefactive condition in which when the meats and so on are cut from the diet benefit comes, but then it is not from the B.B. cultures that are given, which are of no benefit whatsoever, and you are wasting the patient's money and deluding yourselves by persisting in their use. The same is true in taking by the mouth the Bacillus acidiphilus and the combination of bacilli employed in a well-known mid-west sanitarium in what I might term a pseudo-scientific effort.

Now I want to speak about bacterial treatments, and then I will finish.

For a long time I have been interested in the use of bacteria in the treatment of these patients. I believe that so far as bacteriology is concerned we have very much more to learn. We have much more to learn about immunity, both local and general immunity, about specificity and pathogenicity, and so on. And I do not think that while the teachings of Rosenow are very instructive and worth while there has been other than some harm done by them. A lot of men have come to a feeling that if you can take a bacterium and change it not only chemically but morphologically by growing under different medias, where are you going to get to and what is the use of considering specificity? That is not the proper attitude. When you see individuals with abnormal bacteriology of the intestinal canal and the intestinal canal resisting in other individuals with a less significant bacteriology, and in others the intestinal canal breaking down, and when you see this constantly in clinical practice, you must come to the conclusion that there is a great deal more than simply the identity of the bacteria as the cause of the disease. It does hold true for typhoid fever, diphtheria, cholera, and so on, and we have got to go deeper into the study of resistance, immunity, pathogenicity, specificity, and so on, before we will understand much that there is in medicine in connection with bacteria.

The three methods of vaccine treatment that I have used I designate as, first, the use of bacteria of the kind that is infecting, which is grown under different medias so as to rob it of its pathogenicity and using that bacteria in the old immunity way. I call that method biochemical alteration. The second method is to employ bacteria which are antagonistic to the bacteria errors in the gut content. Now in intestinal bacteriology, which is really a science in itself and very different from ordinary bacteriology, we have a great many organisms, about sixty-seven different types, and many of these have symbiotic faculties—that is, one will grow and encourage growing of another, and these will destroy and digest another. You can take, for instance, as a simple illustration, a growth of the gonococcus. When it is growing well add to it a culture of the prodigiosus, and in twenty-four or forty-eight hours there are no gonococci and the prodigiosus only is growing luxuriantly. The first are destroyed, digested, and no longer present. That is an illustration of antagonism, of which there are many examples in the intestinal canal. The last, or third method, is the old-fashioned vaccine method which

you know about, the therapeutic use of the infecting bacteria.

biochemically by growing under different media and these used to substitute those present in the body. Successful examples of this have been found in cases of infections with B. coli, aerogenes capsulatus, mesentericus, and putrificus.

B. COLI GROUP.

Dextrose +
Lactose +

Dulcite +
B. communior
B. communis

Saccharose +
B. communior

| Variety | Mannite | Raffinose |
|---|---|---|
| (A) 1 | + | + |
| (A) 2 | + | − |
| (B) | − | + |
| (C) | − | − |
| (D) ‡ | − | − |

Saccharose −
B. communis

| Variety | Mannite | Raffinose |
|---|---|---|
| (A) | + | + |
| (B) | + | − |
| (C) | + | + |
| (D) | − | − |

Dulcite −
B. aerogenes
B. acid-lactici

Saccharose +
B. aerogenes

| Mannite | Raffinose | Variety |
|---|---|---|
| + | + | (A) 1 |
| + | + | (A) 2 |
| + | + | (A) 3 |
| + | − | (B) 1 |
| + | − | (B) 2 |
| − | + | (C) ‡ |
| − | − | (D) ‡ |

Saccharose −
B. acid-lactici

| Variety | Mannite | Raffinose |
|---|---|---|
| (A) 1 | + | + |
| (A) 2 | + | + |
| (B) | + | − |
| (C) ‡ | − | + |
| (D) | − | − |

I show you this to explain that there are at least eighteen different types of bacillus coli communis groupable by cultural methods, and some of these will hold their specificity under the cultural methods through a number of inoculations. Now of this, the coli group, I am satisfied there are but four types of bacillus coli communis that are pathogenic either within the gut or outside, and that the rest of them are innocent of producing any trouble. These you see are separable by cultural methods.

BACTERIAL TREATMENTS IN PRIMARY TOXEMIAS.

*Rectal and Subcutaneous Methods—Bacterial Antagonisms.*

| | | |
|---|---|---|
| SACCHARO-BUTYRIC. (Heavy protein diet.) | B. aerogenes capsulatus.<br>Gram-positive diplococci.<br>Gram-positive single cocci.<br>B. bifidus. | B. coli (many different strains and perhaps collected from different sources). For the first two *a*; for the second two the *b* strains are best. |
| INDOLIC. (Low protein and high carbohydrate and hydrocarbon diet.) | B. coli.<br>B. mesentericus.<br>Gram-negative streptococci.<br>Gram-negative staphylococci.<br>B. Proteus vulgaris (B. Welch).<br>B. cloaca (B. coli, polyvalent strains)<br>B. pyocyaneus (B. coli, *a* strains).<br>B. putrificus (B. coli, *b* strains). | B. acidophilus.<br>B. Bulgaricus.<br>B. lactic aerogenes. |
| MIXED. (Least possible amounts of foods, no cheese, peeling of fruits — mostly boiled foods.) | No action on antagonisms possible by rectal or subcutaneous methods excepting when a predominant type of bacteria is present. | |

The difference between the *a* and *b* strains of B. coli is that *a* does not produce gas in saccharose; the *b* does. The effects are the same on all the other sugars and on the coagulation of milk.

BACTERIAL TREATMENTS.

*Rectal Methods—Biochemical Alterations.*

Occasionally infecting bacteria can be changed biochemically by growing under different media and these used to substitute those present in the body. Successful examples of this have been found in cases of infections with B. coli, aerogenes capsulatus, mesentericus, and putrificus.

Here are the so-called biochemical alteration methods employed and this chart explains itself. Examples have been found in cases of infection of the gut with the coli, capsulatus, mesentericus, and the putrificus.

This represents the organisms employed when effort is made to break up and favorably influence symbiotic cliques that are infecting the host. The diets employed are mentioned to the left. This method of bacterial treatments is substantial enough when the instillations are kept up long enough—

every fourth day for four or five months. The permanency, however, does not compare with the vaccine methods. It may though be the only way possible to influence favorably an untoward bacteriology in the gut.

BACTERIAL TREATMENTS IN PRIMARY TOXEMIAS.

*Rectal and Subcutaneous Methods—Vaccine Immunity.*

| | |
|---|---|
| SACCHARO-BUTYRIC. | B. aerogenes capsulatus (rectal).<br>Gram-postive diplococci (skin, rarely; rectal, rarely).<br>Gram-positive single cocci (rectal).<br>B. bifidus (rectal, rarely).<br>B. putrificus (rectal, rarely). |
| INDOLIC. | B. coli communis (rectal; skin).<br>B. mesentericus (rectal).<br>B. liquefacius (rectal).<br>B. proteus.<br>Gram-negative streptococci (skin).<br>Staphylococci (skin). |
| MIXED. | Combination of above according to predomination of fermentation or putrefaction and types of organism. The rectal method is used here altogether, and effort is made to get reactions and a leucocytosis of from ten to twenty thousand within eight hours after the injections. |

This represents the methods that have given the best results, and should be carried out whenever possible. The results are more lasting. In 27 of my cases for twelve years, and the many hundreds since then all have remained well. I began doing this work twelve years ago. The diets employed are given here also.

I have been at this dietetic and vaccine work since 1907, and it has been a hard work, and at the present time there have been treated over four thousand cases. When I say treated I mean over 4000 cases fully followed—to be exact, 4472. These cases have each been under treatment at least four months. The usual length of time of monthly examination of stools after treatment makes up nine months, but only four months of vaccine work. In these 4472 cases there were dispassionate reasons for believing that a pathology existed in the colon in at least two-thirds, to be exact in 3126, which may be called chronic colitis. The types as to the saccharo-butyric, indolic and mixed were about even. In all of these treated cases I have had but three of what I term unfortunate results from vaccine methods. One was a case in which coli was used and a pus kidney eventually developed, possibly from ascending infection from the bladder. The second was a case in which the coli was used; in this one there was an open hemorrhoid, some vaccine was given by the rectum, and a phlebitis of the left broad ligament, finally going to the leg, took place. The third was a mild form of septicemia. This ran a characteristic temperature line, and in this case I cultured the identical organism used from the blood. They all, however, got well.

I have definitely come to the belief that in the many things that I have been interested in in medicine this is by far the best work I have done. I began, first a student, and then finally a most severe critic (criticizing myself and being my own worst enemy for years before I launched out in the use of vaccine in the human being); and I have become most enthusiastic. I am convinced that there have been accomplished by these vaccine methods far more than I ever could have accomplished by the generally known and employed methods alone. I have worked this out in controls numerous times, the results always being identical. On Saturday I saw the second case that I had treated, one of twelve years ago, a woman who had a gas bacillus infection treated by instillation of coli of the rectum and diet four to six months. In the twelve years she had been out of the country, in Egypt, India, Japan, and under what may be considered were abnormal dietetic conditions at times, particularly during the war. I was interested when going over a specimen of the stool to find that the bacteriology which she has to-day is exactly the changed bacteriology that she left me with twelve years ago. It is interesting that you can change the bacterial picture these ways, and that you can change it so that eventually the individual will remain with the changed bacterial picture independent of

any type of diet. I am satisfied with the striking results that have been accomplished in numerous instances (results which I have really not the courage to tell you; you can hardly believe them at times, I am certainly startled every little while); and that you can take a person and, however it is accomplished, change that person in biochemical ways and substantially clear off a pathology of the sorts I have mentioned.

My remarks began by speaking of chronic colitis, and I have gone very far afield apparently, yet I have presented what, in my opinion, is the etiology of chronic colitis and the best way of treating chronic colitis.

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## PATHOLOGY AND TREATMENT OF CHRONIC OSTEOMYELITIS IN UNHEALED WAR WOUNDS.

BY ROBERT GOODMAN, M.D.,
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The two chief clinical signs of traumatic osteomyelitis are bone enlargement and discharging sinuses. This enlargement, if the middle of a shaft is involved, causes a spindle-shaped bone; if the end of a shaft, a club-shaped bone. When both ends are club-shaped it is because the whole diaphysis has been shattered. This latter is rare, because these cases usually end in amputation.

Enlargement of bone often does not appear marked when a limb is inspected, due to muscular atrophy. On palpation, the irregular mass of bone can be felt, with projections due to the original ends of displaced fragments, smoothened, however, by subperiosteal callus. The skin is thick, hot, and unyielding. Some areas may be sensitive. These bone masses communicate with the surface by one or more sinuses either through the original wound or through abscess tracks. These sinuses usually run straight to the bone. They commence in a scar whose ends are soft, but thick and brown and of a funnel shape at the end of the sinus. The discharge may be serous or of thick pus. Sometimes a dry crust covers the sinus mouth. Even when there is very little discharge the skin is inflamed, and may be covered with scabs or with the discharging pus. This chronic eczema often lasts for a long time after complete sinus closure, simulating an old persistent sinus. A probe placed in the sinus easily reaches the bone. Necrosed bone gives a clear, sharp tone. If loose it may move a little. From time to time small sequestra issue from the sinuses with the pus, which for the last few days has been increased in amount, with increase in inflammation. This throwing off of sequestra leads to local improvement, even to healing; but a new abscess will form almost always which again reopens the former track, therefore no permanent cure can be looked for in most cases.

The part of the limb, especially the lower limb, distal to the lesion is often edematous for a long period, with cyanosis of the skin and muscular atrophy.

Neighboring joint function suffers in two ways: First, if from an inflamed epiphysis, from the spread of the inflammation, and consequent arthritis with fibrous or bony ankylosis, or limited in motion because of enlargement of the bone end. Secondly, if the joint is at a distance from the lesion, it may have limited motion because of muscular fibrosis, or to fixation for a long period, as is often seen in the fingers.

This stiffness, ankylosis, atrophy, contracture, muscular adhesions, together with the shortening due to the osteomyelitis, are the chief causes of functional disability. These, with the acute inflammatory attacks, cause the pain and disability which go with chronic osteitis with sinuses. Exacerbations of inflammation usually are accompanied by evening temperature. Usually the

patient is comfortable but pale. The chronic suppuration may produce a so-called mild septicemia.

Osteomyelitis results either in the production of new bone (osteosclerosis) or rarefaction (osteoporosis). It occurs in both compact and cancellous tissues. Bone-marrow is a soft vascular tissue which helps produce and then nourishes the calcified structure.

An aseptic irritation of moderate inflammatory severity stimulates bone-producing power of the endosteum and periosteum and so forms osteosclerosis. Severe pyogenic infection devitalizes the marrow; the bone receives poor nutrition, and so we have osteoporosis. Compact bone is made up of concentric layers, tunneled by Haversian canals, in which are the medullary tissue and capillaries. These canals have transverse branches with openings under the periosteum and others running to the endosteum. Therefore the capillaries reach from one to the other. The medullary canal is really a huge Haversian canal. In subperiosteal inflammation, bone cells are thrown out, and this hyperostosis is thick at the seat of injury, or infection, and hard, and the edges are softer.

The periosteum is raised by suppuration or inflammation, as the case may be, and the swollen marrow strangles the blood-vessels of the Haversian canals, and so the bone shaft is not nourished; it necrodes at the site of injury or infection. Beyond the necrotic area is an area of rarefaction, and above that condensation. Therefore necrosis occurs *en masse*. Dead bone is dense, white, and smooth. On touch by a probe the sound is clear and dry. Marginal proliferation and then suppuration occurs at the junction of the living and dead bone. The Haversian canals enlarge, the bone rarefies and then disappears. A red line of demarcation appears, and in time the dead bone is free. The sequestrum cannot fall out because of subperiosteal ossification, which went on during the process, and because of healthy bone above and below. The subperiosteum may contain pus which causes periosteal perforations, and the sinuses of the soft parts transport it to the surface.

In the spongy bone of the epiphysis, and in short, thick bones, subperiosteal bone formation is almost absent, therefore rarefaction exists alone. The bone trabeculæ are absorbed, and cavities take their place filled with granulations or pus. Occasionally a light spongy sequestrum is formed here. A probe passes through this carious osteitis like butter. In a simple osteomyelitis such as occurs in a suppurating amputation stump, the bone is white, and the marrow swollen and red. The Haversian canals enlarge and the only necrosis that may occur is the fine bone dust thrown off with the pus. The end of the bone ossifies, closing the Haversian canals and the medullary canal for about an inch up, the medullary canal ending in a tapered point. In more severe cases the end is club-shaped because subperiosteal new bone is formed. At first the end is covered by the soft tissue and is adherent, but it soon becomes movable. In cases in which the soft tissue is thin over the end repeating ulcers occur.

In the most severe cases of infection necrosis occurs, and the subperiosteal new bone, overproduced in amount, becomes carious. The air in contact with the white bone soon turns it black and it dies. In six to eight weeks this sequestrum becomes free, the proximal end having before death, as before described, been the seat of rarefying osteitis. The line of demarcation is notched and irregular. Periosteal new bone surrounds both living and dead bone. The medullary substance may increase in amount, and with the thinning of the shaft the bone may soon partake of the appearance of a spina ventosa (as seen in sarcoma) and may extend up as high as the epiphysis.

The soft tissue is edematous, the skin is inflamed, tender to the touch, and adherent to the end of the bone, which is also painful. Sinuses may close up and break forth again.

An edematous stump cannot support an artificial limb; new abcesses or sinuses may occur from the friction. This is true in

peace as well as in war surgery. Where the bone ends are necrotic, it is best to wait for the loosening of the sequestrum and then divide the bone above this, unless it is near a joint. A movable joint with a small stump is always sought for.

War wound infection is more lasting than civil surgical wounds and requires long after-treatment. In fractures with an open wound we deal with three things: first, arrest of infection; second, union in as good position as possible; and third, the treatment of the obstinate chronic osteomyelitis. A simple curettement of the sinus is of no avail, and may stir up infection. Chronic osteomyelitis after apparent healing commonly relapses. A bullet or shell fragment may comminute a bone shaft or it may merely tear the periosteum and bare the injured bone. Here the bone, exposed, at the bottom of a suppuration wound, necrodes and a small sequestrum is thrown off, leaving the edge of the bone rarefied. We should not, however, operate until some separation occurs. Over the tibia, because of poor subcutaneous covering, soft parts are slow to heal; the scar is thin, poorly nourished, and liable to frequent ulceration.

In sequestrum formation of a deep bone like the femur the sinus discharges pus and necrosed bone for months, and subperiosteal bone formation may bind the sequestrum down. The *x*-ray will show bone of normal density except at one spot, where the dark shadow of the sequestrum is surrounded by a rarefied area.

Usually an injury to the epiphysis of bone becomes the seat of rarefying osteitis which spreads through the spongy bone. A large cavity finally forms. This is slow to heal, and frequently we have a chronic synovitis. Where the *x*-ray shows a foreign body, which is usual where only one entrance is seen, immediate operation is called for. A foreign body, according to Sir Alfred Keogh, should be removed, for even though it may seem aseptic it may later cause inflammation; also walling off of infection by osteosclerosis of a rarefying osteitis near an epiphysis is rare, and it is best not to allow it time to develop.

In infection of a bone fracture by gunshot two processes occur—separation of necrosed bone and union of the fractured bone. Both the attached and the partly detached fragments become sequestra. These sequestra are different from those liberated by a rarefying osteitis. They have smooth, sharp edges, and no serrations like a slowly dying bone sequestrum. Union of bone fragments occurs side by side with liberation of secondary sequestra.

In fractures such as the trochanter of the femur, callus plays only a small part in bone union, the stripped periosteum for a long distance up and down forming successive layers of new bone and becoming very thick and hard. Sequestra in this location are of large size. If left alone, the infection tends to spread and more bone dies; this accounts often for apparent healing with formation of sequestra at a site removed from the seat of injury and infection.

Attacks of acute and subacute osteomyelitis occur; therefore traumatic osteomyelitis resembles spontaneous osteomyelitis of childhood.

Sinuses persist because of osteitis, and because of a suppurating cavity or necrosed particles of bone, and must be removed with the removal of its source. When ankylosis of small bones, as in the foot, occurs, steps must be taken to prevent faulty position, with poor functional results; in joint involvement a so-called ideal position of election is of importance.

The sinus dates back to the beginning of the disease. Inflammation subsides, the area of osteitis becomes circumscribed, and the suppurating track settles down to form a chronic sinus, which remains until the focus has been radically dealt with.

Where the fracture was originally exposed in a wide suppurating wound, complete healing of the soft parts does not occur. Secondary sinuses occur in fracture caused by bullets, which seem to unite at first without suppuration, but which later open, especially when a foreign body is re-

tained. During the time when the wound narrows down to form a sinus, the bone enlarges, and in three or four months reaches its maximum. Abscesses with constitutional symptoms occur. They must be opened and the pus evacuated at the point of most fluctuation; if not opened, they burst and form another sinus.

The area of rarefying osteitis enlarges around the necrotic cavity, and if not treated surgically is incurable. If a radical operation is performed at the right time, with careful after-treatment, final cure is the rule. Even after cure the adherent scar is a source of trouble. Also small latent foci of infection may light up years later.

Acute diffusive osteomyelitis following compound fractures in civil life with careful surgery is rare. In war wounds, however, complications are frequent, due to the extent and severity of the bone lesion, infection by missiles and clothing, and hasty first-aid treatment.

TREATMENT.

Do not use gauze drains; they do not drain, but keep up the discharge. It must be remembered that the sinus is not the primary lesion. Sunlight or heliotherapy is beneficial in tuberculosis, but not of any value in osteomyelitis. The only treatment of osteomyelitis is operative, at the proper time. Remove the superficial sequestrum and the cure is rapid if the cavity is small. Deep sequestra make the operation more difficult, with the presence of large cavities; but other methods are useless. The cavity must be obliterated. Spoon curettage of the sinus and cavity is useless; and radical excision is indicated especially in suppurating cavities. The healthy bone which forms the wall of the cavity fills up with a blood-clot, becomes fibrous, then cartilaginous, and then lime salts are deposited. The periosteum sinks into the cavity, and the depression always remains; the periosteum and endosteum forming new bone.

Filling of the cavity with sponges, decalcified bone and iodoform pastes have been used, but not very successfully. A wide removal of bone, allowing the neighboring soft tissues to come into contact with the remaining bone, is advocated. The cavity and sinus decrease in size gradually. Subsequent scraping is often necessary, because of secondary necrosis.

In cases of absence of a section of bone, regular flushing by the Carrel-Dakin method, until the infection and necrosed bone is eliminated, with subsequent bone transplantation, is successfully used.

Antiseptic serum should be given forty-eight hours before operation. Do not remove a joint if it can be avoided; an ankylosed joint is better than a flail one.

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## TUBERCULOSIS IN CHILDREN.

CATTERMOLE, in *Colorado Medicine* for October, 1919, states that between the ages of four and fifteen years there are not many children who show active tuberculosis. Before four years of age tuberculosis of the bronchial glands, meninges, peritoneum and lungs is common. After four years the most common seat is in the bronchial glands; the cervical glands are also often involved, and, in a smaller number of cases, the joints.

The mortality from tuberculosis is low between the ages of four and fifteen years, even though the number of children who react to the skin tests gradually increases during these years. These children have a high degree of resistance to tuberculosis, and it is then that they should acquire immunity. In those children who have active lesions in the joints, glands, or peritoneum there is a marked tendency to heal.

The tracheobronchial glands are infected in a large proportion of the children who show a positive tuberculin reaction. There are more of these glands about the root of the right lung than on the left side, and this is why we usually find greater dulness and rougher respiratory sounds on the right side. This is one of the diagnostic signs in children. The tendency to greater involvement continues in the right apex, so that in adult life we usually find the older and more advanced process there.

Children who show a marked skin reac-

tion often appear in the best of health. Such children may show no signs of enlarged bronchial glands when they are well, but when they have any acute infection, such as measles, pertussis or influenza, these glands enlarge and produce cough, dulness on percussion, roughened and prolonged respiratory sounds, increased vocal fremitus, and d'Espine's sign in the back.

After the child has recovered from the acute disease, the glands gradually return to their usual size and condition. If the child is poorly nourished, or if convalescence is delayed from any cause, the glands may not only remain large, but it is reasonable to suppose that infection may extend from them to other tissues.

In following such cases it is the rule to find that with each acute infection these glands enlarge so that the condition has been called recurring tuberculous bronchial adenitis. This can hardly be designated a latent tuberculous condition. It is an infection which is held in check as long as the child's resistance is good. Such a child shows a prompt and marked reaction to the skin test, due to the presence of antibodies in excess.

If the child is overwhelmed, as in tuberculous meningitis, there may be no reaction. In severe tuberculous conditions the skin reaction may be faint or absent, but if the child improves it will show a well-marked reaction at some later time.

In children who lack sufficient resistance to combat the infection there is weakness, anemia, loss of weight, cough, and maybe fever. Here the fight is on between the infection and the individual. He has acquired some immunity, so that he is not likely to have an acute form of the disease. The lung, which is the most susceptible tissue, becomes involved, and unless his resistance improves he may later show some one of the many types of pulmonary tuberculosis.

Only a small number of children die of pulmonary tuberculosis. This is due to their active metabolism and to the out-of-door life at this age. They escape the serious forms of the disease during childhood, but they probably furnish the cases of tuberculosis seen in later life. Boys who have had such infections between the ages of four and fifteen years and who have made poor recoveries, are the ones that are found in army examinations. They will break down under strain, fatigue, exposure, and poor food.

An animal which has an active tuberculous infection cannot be reinfected. It seems reasonable to presume that a child with tuberculous bronchial glands may be protected from further infection, and that if his general conditon remains good he may become immunized.

To maintain a child in the best physical condition he must have plenty of suitable food, out-of-door life, sunshine, and he must be properly dressed and housed. There is no specific treatment for the disease. Tuberculin can be used in certain chronic conditions which are not progressing favorably. Heliotherapy is of great value.

Infants and young children should be removed from parents and others having open tuberculosis. Tuberculous persons having coughs should wear masks when in the company of children.

It is very difficult to diagnose tuberculosis in children from physical signs in the chest. The skin tests should be used in order that we may know all of the children who are infected with tuberculosis. He is in favor of a general test of all schoolchildren. It would enable us to study the progress and development of the disease and to determine whether those who are infected in childhood or those who are infected in later life are the ones who make up the army of consumptives.

Cattermole's table includes tuberculin skin tests made on four hundred and nineteen children. Of these, forty-seven per cent showed positive reaction and fifty-three per cent were negative. One hundred and sixty-five private patients showed forty-two per cent positive and fifty-eight per cent negative. Two hundred and fifty-four charity patients showed fifty per cent each of positive and negative reactions.

# EDITORIAL.

## CARDINAL PRINCIPLES IN CARDIOLOGY.

During the last ten or fifteen years an immense amount of additional information has been gained, largely through the use of instruments of precision, as to affections of the heart. These instruments have shown us with absolute accuracy what careful clinicians had, in some instances, always considered to be the fact, namely, that the most serious conditions which affect the heart are not valvular lesions, and in one sense not lesions of the myocardium in that the entire myocardium is diseased, but that, because of certain foci of degeneration, the normal action of the heart, and the length of life, have become seriously jeopardized.

It is not so many years ago that the physician on hearing a murmur in the heart arising from disease of one of its valves considered that this was a most important discovery, and was prone to go one step further and believe that it was responsible for nearly all the symptoms which the patient presented. Now we know that the absence of a murmur may indicate that the heart is not strong enough to drive the blood through an orifice with sufficient vigor to produce a murmur, and the absence of a murmur in the presence of cardiac symptoms is of more diagnostic value and greater prognostic import than its presence.

The murmur of aortic obstruction, so far as its association with cardiac failure is concerned, is really of comparatively little significance, and this holds true also of mitral regurgitation. These two conditions, at the aortic orifice and the mitral orifice, may be said to possess no great importance as to cardiac efficiency provided only that the left ventricle is able to compensate for the resistance in front or for the regurgitation behind. Yet cases are constantly met with in which the physician and patient are greatly alarmed at the discovery of one of these murmurs, and both of them are prone to think that their presence means an early loss of physical efficiency and early death, which is far from the truth. On the other hand, it may be stated that the murmur of aortic regurgitation and that of mitral stenosis possess far greater significance, and this is particularly true of stenosis, for several reasons: First, because the diseased process which induces stenosis often dips so deeply as to involve His's bundle and thereby impairs conduction, and, secondly, because the difficulty experienced by the auricle in emptying itself results in paralytic distention of the walls of this cavity, pulmonary congestion, and increased labor for the right ventricle. Furthermore, in mitral stenosis it is by no means uncommon, indeed it may be said to be fairly constant, that auricular flutter or auricular fibrillation develops so that the patient with this lesion in addition to the mechanical condition which produces a murmur may have not only partial or complete heart block but also the two auricular states to which we have just referred.

The electrocardiograph has enabled us to make wonderful strides in determining the efficiency of the heart muscle and has given us facts which for the first time enable us to reach conclusions which rest upon scientific facts, rather than a mere guess, but nevertheless a very large number of practitioners, even when able to subject a patient to an examination by means of the electrocardiograph, are content to administer powerful cardiac stimulants in a somewhat haphazard manner.

In auricular flutter and auricular fibrillation the doses of digitalis which are commonly given are entirely inadequate to produce good results, whereas in partial heart block even moderate doses of digitalis, as we have often pointed out, may induce death.

Those of our readers who are particularly interested in this subject, and most of them are, will do well if they will read

the somewhat long but nevertheless important contribution recently made to the *British Medical Journal* by Lewis of London, which we publish in the Progress columns of this issue.

That murmurs themselves have little significance he once more emphasizes, but this cannot be emphasized too much. Sometimes we have thought that both Lewis and MacKenzie, who have been leaders among writers on cardiology, were too much inclined to be dogmatic and positive in their statements, but occasionally dogmatism is advantageous if it serves to leave on the mind of the hearer or reader a definite and concrete proposition. This is the case in the article to which we refer, which we consider one of the best summarizations of our knowledge in regard to the prognosis, diagnosis and treatment of heart disease which has been put into comparatively short space in many years.

## TOXIN-ANTITOXIN AND DIPHTHERIA.

For a number of years it has been possible, as our readers know, for physicians to determine whether a given number of children are susceptible to diphtheria by the use of Schick's test, those who do not respond having been found to possess a sufficient amount of natural antitoxin to afford adequate protection. This test has now become universally recognized as most valuable.

Subsequent to its introduction it was found that by mixing a known quantity of toxin and antitoxin together in small amount it was possible to confer immunity upon those persons who were shown to be susceptible to diphtheria, thereby avoiding the necessity of administering large doses of antitoxin as an immunizing agent.

This toxin-antitoxin prepared by various manufacturers has been employed in thousands of cases all over the world with excellent results and with remarkably few untoward manifestations. Like many other products of this nature, its preparation is more or less under the supervision of the United States Public Health and Marine Hospital Service, which is an additional guarantee of the care exercised in its production.

It so happens that within the last few weeks the medical profession has been startled by a report of several deaths having occurred in children after a so-called toxin-antitoxin injection, and this fact will doubtless make many practitioners withhold this immunizing agent, when in reality it should be given as freely as before.

That there is nothing fundamentally wrong or dangerous in its use seems to have been proved by innumerable patients who have received it with safety.

Startling as these three deaths are we must remember that the deaths may have ensued from another cause, and that as compared to the thousands of patients who have been given it, this mortality should have little influence upon the favorable statistics which have already accrued. We doubt not that in the near future some explanation for these accidents will be forthcoming.

Nothing was more startling in the early days of the use of antitoxin than the comparatively few deaths from anaphylaxis which were reported. It still remains true that there are some hypersensitive persons in whom the giving of antitoxin may result in disaster, but they are few and far between, and he who withholds antitoxin in diphtheria is very much in the same position as he who withholds water from a house which is on fire lest the water produce damage. The danger from disease is infinitely greater than the danger from anaphylaxis, and this holds true so far as we know in regard to the use of toxin-antitoxin.

It is interesting to note in this connection that in the *British Medical Journal* of November 8, 1919, McCallum reports a case of anaphylaxis following the injection of diphtheria antitoxin subcutaneously, the dose being only 2000 units. The child was eight years of age, and it died within a few minutes with the dyspnea and cyanosis characteristic of anaphylaxis. The autopsy

was absolutely negative. The dose was given as a prophylactic.

As we have already said, when we consider the millions of doses that have been given and the millions of lives which have been saved, such unfortunate occurrences should not make us hold our hand when the disease is really threatening.

## CAN AURICULAR FIBRILLATION BE CURED BY TREATMENT?

Although auricular fibrillation has been recognized by the profession as an important manifestation of grave cardiac trouble for a number of years, and although much study has been devoted to the effect which digitalis is capable of exerting in patients suffering from this state, we have still much to learn concerning it, and there is a difference of opinion, even to-day, as to how digitalis produces its chief influence for good. It has generally been held that a patient having once developed auricular fibrillation of some duration has an incurable condition, and that, while digitalis may be advantageous to him so far as his ventricles are concerned, his auricles will continue to fibrillate. It is true that at times single cases of auricular fibrillation have apparently been relieved permanently, but the vast majority undoubtedly continue to fibrillate until the end. A case reported by Lea in "Heart," Vol. VII, No. 2, is of interest in this connection. A woman of fifty-one presenting marked evidences of failing heart and giving a history that she had had shortness of breath since eleven years of age, presented herself for treatment, stating that for many years she had suffered from cardiac symptoms, palpitation, and swelling of the legs and stomach. She presented typical auricular fibrillation in association with a double mitral murmur. Given 0.3 Cc. of strophanthone (P. D. & Co.), diluted with an ounce of normal saline intravenously, marked improvement occurred; the subjective symptoms being relieved in half an hour and the pulse falling from 160 to 90 per minute. The irregularity of rhythm, however, remained and the auricular fibrillation persisted. She was then put upon fairly large doses of digitalis and greatly improved, passing from observation. She returned to the care of Dr. Lea the following year, when she improved very markedly under digitalis.

It should be recalled, however, that to follow full digitalis by full doses of strophanthus is dangerous.

The use of the electrocardiograph in this case showed that fibrillations may be made to disappear so that normal auricular action is resumed; in other words, by the skilful use of digitalis it is apparent that the prognosis in some cases presenting this disorder of the heart is better than it has been considered heretofore.

There is an additional point of interest in the report made by Lea concerning the prognostic importance of valvular lesions in connection with marriage and pregnancy. Although as already pointed out this woman had had cardiac disease since the age of eleven, and at fifteen suffered so much that she had to give up work, nevertheless she married and bore nine children before the time she came under Dr. Lea's observation. This single case does not in any way invalidate the general opinion that mitral stenosis is a grave contraindication to pregnancy, but illustrates that cases are occasionally met with in which many pregnancies are survived.

## PLEURISY.

Within the last two or three years our conception of the physical signs and symptoms produced by pleurisy, with or without effusion, have undergone material modification, because of the multiple infections which have taken place in large numbers of men and women. We now recognize better than ever before that not only may a pleuritic infection be limited in area, but that the attachment of one part of the pleura to another may also be limited and of such a character as to form a pocket

or cavity in which serum or pus may accumulate. This accumulation fails to produce classical physical signs, and, if we attempt to tap, is so limited in scope that if the needle goes through both walls of the sac a dry tap is obtained. As a result it is supposed that an error in diagnosis has been made. While, therefore, we have learned that the diagnosis of pleurisy is a much more complicated problem in many instances than it was heretofore thought to be, we have been placed on guard as to diagnosis, and our methods of treatment have become much more accurate.

In this connection a communication to medical literature by Horder in the London *Practitioner* upon this subject possesses a good many points of interest to our readers. In much the same way that the pain of appendicitis may be referred by the patient to a point so high as to lead to the belief that a pleurisy is present, so may it also be possible for a pleurisy pain to be felt as high as the cervical vertebræ or as low as Poupart's ligament, and Horder claims that it is by no means unusual for a pain due to pleurisy to be felt at the extreme tip of the shoulder when there is not any actual shoulder lesion. Soo too he points out that a pleuritic friction sound may be imitated by what he calls a muscular rumble or by a rhonchus. Muscular rumble is, however, heard all over the chest and is continuous, whereas the pleuritic rub is rhythmical. The one is nearly always bilateral, the other nearly always unilateral, and last of all the rhonchi can be made to increase or disappear by a cough or deep breathing.

Another point of considerable importance well known to many diagnosticians, but often overlooked, is that Skodaic resonance just below the clavicle, though highly suggestive of pleuritic effusion, is not pathognomonic, since it is sometimes present in cases of solid lung due to collapse, pneumonic consolidation, or malignant growth.

Horder believes that a primary pleurisy with a serous effusion is often due to infection of the pleura by the tubercle bacillus, and in this opinion we are in accord, provided the invasion is insidious and not following a sharp attack of fever with pleuritic pain, as when the pneumococcus is the responsible agent. Effusions due to the tubercle bacillus show a high lymphocyte count, and if the fluid when removed is centrifuged and injected into a guinea-pig, the fact that the tubercle bacillus is responsible will often be rendered manifest.

A point which we confess is new to us, but put forward with a great deal of emphasis by Horder, is that a left-sided pleurisy may be the first attempt at drawing attention to the existence of a gastric ulcer, and again he calls our attention to the fact that pleurisy develops not infrequently between the third and eighth day after the operation for gastroenterostomy, and, curiously enough, is rarely dangerous although it may be alarming.

So, too, in regard to blood-stained effusion from the pleura. Horder expresses the view that malignant disease is not the most common cause as many think, but that tuberculosis is, and that mitral stenosis complicated by dilated right heart may also induce a bloody effusion, as may influenza, to which we would add the qualifying statement, provided that the streptococcus hemolyticus is the dominant factor.

So far as the treatment is concerned, he points out that the movements of the accessory muscles of respiration and especially of those connected with the shoulder girdle are prone to prolong an attack of pleurisy as is shown by the fact that not infrequently when a patient is permitted to move the arms freely after a period of strict rest in bed there will be an increase of pain and a rise in temperature. Therefore, it is often well not only to strap the chest but to immobilize the arm on the affected side by strapping it also.

On a number of occasions we have discussed the question as to when aspiration ought to be performed for the relief of effusion. Of course the fluid should be drawn off if the quantity is so very large that little hope can be had of its absorp-

tion. So, too, it ought to be drawn off if there are symptoms of cardiac or respiratory distress, and again it is often wise to interfere when the effusion persists for a period of two weeks with no signs of being absorbed. At least this time however should be allowed nature in which to carry out the reparative process, as if she is able to do it the results will often be better than if the physician interfered.

Another point in regard to the matter of aspiration for fluid which Horder discusses, and which we have taken up in earlier issues of the GAZETTE, particularly in the clinic which the writer of this editorial published in a recent issue, is the question as to whether an effusion in tuberculosis may not be one of nature's methods of putting a tuberculous lung at rest, in much the same way as the physician puts it at rest by artificial pneumothorax. In such cases, if it is deemed necessary to aspirate, it is certainly unwise to draw off all the fluid since the sudden expansion of a tuberculous lung may result not only in an extension of the disease in the lung itself, but in the spread of the infection to other parts of the body, or the sudden expansion may result in the production of pneumothorax. In these cases, too, the employment of wash bottles in order that the patient may expand his lungs by transferring the water from one bottle to another, or the employment of deep respiration exercises, is to be resorted to with great care for the obvious reasons which we have just mentioned.

## THE RELATION OF PATHOLOGY TO PRACTICE.

At one time it seemed as though the practitioners of medicine might be divided into two great classes: those who worship, sometimes blindly, at the feet of the Pathological shrine; those who either utterly and entirely despise it, or regard it merely as a name. There has been a tendency in more recent times to the meeting of these two forces on a common ground with a clear recognition of the fact that only by a knowledge of pathology, by a study of its expression in clinic, its manifestations at the operating or the autopsy table, can the practitioner or the surgeon attain the highest type of wisdom which experience should bring.

Wood (*Journal of the American Medical Association*, Aug. 23, 1919) believes the pendulum has swung too far. As a body of professional men we are in danger of entirely neglecting pathology. He states that the lack of interest in this branch begins with the student, who he says is badly taught in many institutions. His anatomy is not correlated with clinical branches. He is not brought in close contact with a sufficient number of necropsies. The physicians and surgeons at the hospitals as a rule no longer insist upon this being carried out. Moreover, after he leaves the regular course in pathology he falls into the hands of men instructing in the clinical branches who often know less pathology than does he. If the attempt is made to correlate the physical signs and symptoms of disease with the pathologic changes which underlie such signs and symptoms, the student is apt to be confused by the contradictions between the matter taught in the laboratory and that in the wards. As he progresses toward his hospital years of practice he sheds the thin epidermis of pathologic anatomy he at one time possessed, and enters into practical life with a mind unburdened by even the remembrance of this as a science. In his hospital he sees few necropsies, being actively engaged in work which makes its more direct appeal to him.

It is asked if the Mayo Clinic and the General Memorial Hospital of New York succeed in obtaining a permit in over 90 per cent of deaths, why does Bellevue Hospital obtain only 7 per cent? There is reason to believe that there are few necropsies to-day because of the physician's greater interest in functional test, the morphological foundation on which the readings from these should be based being regarded as unessential.

An excellent example of the admirable results following a combined attack upon

clinical problems is afforded by the great advance that has been made in the past fifteen years in the correlation of anatomic findings with groups of clinical symptoms in the diseases of the nervous system. The internists could well imitate the neurologists in their laborious studies in the cellular pathology of the nervous system.

Wood translates the surgeon's attitude toward pathology as that of one who regards this specialty as dead though still somewhat annoying. He goes on to state that even the physician is not blameless from the standpoint of the surgeon, the latter being quoted to the effect that "the place to learn diagnosis and treatment is at the elbow of the surgeon. One may, under these circumstances, venture to look forward to a medical Elysium in which the crude methods now employed will be abandoned and diagnosis made definite and therapeutics infinite in power by the simple procedure of exposing the offending organ, studying its pathology *in situ,* and prescribing with a certainty now impossible. Such a time will be anxiously awaited by all but the patient."

A summary of Wood's brief but forceful article is to the effect that pathology is to-day too largely confined to medical schools and teaching hospitals. As it is the foundation of all medicine, the student should be inspired to carry on its study as a part of his practical life. The physician must know and use it to temper his diagnostic and therapeutic enthusiasm. While the diagnosis and treatment of the individual suffering from disease is the art of medicine, we must not become so busy as to neglect the science of medicine, which concerns the future of the race.

The surgeon also needs pathologic training to enable him to make a certain diagnosis when some unexpected lesion is discovered during the course of an operation. He needs tumor pathology above everything else, for unless he knows it the operative results on cancer cannot be improved on as they should be. A knowledge of pathology, in other words, is essential for correct diagnosis, prognosis, and treatment.

## AN EXPERIMENTAL STUDY OF THE SUBJECT OF SHOCK.

To one who has been even an amateur in the study of physiology, it is amazing to observe with what avidity the profession seizes upon a well-conducted, or for that matter a merely spectacular, animal experiment and transfers its findings to man with the full assurance that the laboratory conclusions will be borne out by practice. As a rule, with some notable exceptions, this hope is not fulfilled. Nevertheless, each new promulgation from the experimental side, if it be ingeniously and convincingly set forth, excites again a hope, and what is of more consequence, a trial, which is at times disastrous. It is therefore with more than usual satisfaction that the surgeon will read the conservative conclusions of Mann based on a carefully conducted experimental study of surgical shock (*American Journal of Physiology,* October, 1919).

Mann produced shock by exposing the abdominal viscera and subjecting them to occasional sponging with dry gauze, or changing them from one side of the body to the other. When blood-pressure had decreased and remained rather stationary at the desired level, which usually occurred in one or two hours after the exposure of the viscera, they were returned to the abdominal cavity and the wound was closed. After a length of time sufficiently definite to determine that blood-pressure would not increase, procedures to improve the condition of the animal were instituted. The blood-pressure was taken as the criterion of the animal's condition because it affords the easiest method of comparison. All other signs of shock were noted.

Anesthetized control animals were observed, under similar ether tension.

Blood-pressure which has been decreased and remains stationary below a certain level, and is allowed to remain there even for a very short time, cannot be restored or maintained by any known method of treatment. Mann has estimated the pressure below which no hope for restoration could

be held as half the initial pressure, maintained constant for one hour. The methods of treatment, with very few exceptions, proved of no permanent value, if the blood-pressure had been decreased to less than half of its initial value. This is true regardless of the means by which blood-pressure is lowered.

Mann was unable to demonstrate any helpful action from strychnia or other alkaloids. He concludes that heat and blood transfusion hold out the greatest promise of help.

In this relation Gasser, Erlanger and Meek (*American Journal of Physiology*, October, 1919) note that the blood volume was found to be decreased in all forms of experimental shock studied and after all grades of damage. This they attribute to dilatation of the capillaries and small veins with greatly decreased movement of the circulation. This is always attended by some loss of plasma. They show that the transudation of plasma is greatly opposed by injection of 4 Cc. per kilo of 20-per-cent acacia before traumatization. The mechanism of action is believed to be due mainly to the antagonism to filtration by the resulting increase in the osmotic pressure of the plasma colloids.

# REPORTS ON THERAPEUTIC PROGRESS.

## SYMPATHETIC OPHTHALMIA.

ZENTMAYER, in the *Pennsylvania Medical Journal* for November, 1919, states that the striking fact brought out in the war statistics of ocular injuries is the rare occurrence of sympathetic ophthalmia. Dimmer attributes this rarity to (1) early enucleation; (2) healthy condition of the patient. To these must be added resection of the iris and the use of conjunctival flaps.

In an unpublished communication Dr. de Schweinitz states his belief, based on his observations in France, that four factors have been potent in reducing to a gratifying minimum the incidence of sympathetic ophthalmia in the present work: (1) Accurate recognition of eyes so injured and inflamed that they should be sentenced to prompt excision; (2) proper early treatment of injured eyes; (3) the healthy general condition of most of the soldiers; (4) abstinence from unnecessary minor operative procedures.

In the Lariboisiere ophthalmic center there were seen 6265 military injuries to the eyes with but one case of sympathetic ophthalmia. Lapersonne and Saxe each saw one case in his military service, while Sourdille saw not any. Of 39 cases of sympathetic ophthalmia seen by Morax, 10 presented intraocular foreign bodies. In all but 6 of Morax's cases the exciting injury was a perforating wound of the cornea or anterior part of the sclera. Angelucci believes that after eight weeks from the time of the injury the danger of sympathetic ophthalmia is almost passed, though Morax had, in one case, a period of latency of seven and one-half months. Morax points out that sympathetic inflammation coming on after surgical intervention may be due to the original injury rather than to the operation.

According to de Schweinitz sympathetic ophthalmia need not be seriously considered in case the eye is hopelessly shattered, is blind from a contusion without perforation, or is suppurating. Nor is a retained intraocular foreign body in non-infected surroundings of itself necessarily a menace to sympathetic ophthalmia.

To state some of Zentmayer's experiences with certain of the clinical features of sympathetic ophthalmia: The disease may develop after cataract extraction where the operation has been followed by a slow, not severe, iridocyclitis without other evidence of infection; a period of eight weeks may supervene between

enucleation undertaken because of severe iridocyclitis following extraction of an intraocular foreign body with a magnet and the development of sympathetic ophthalmia. Both these facts argue more strongly for the anaphylactic than the bacterial metastatic origin of the disease. The histologic findings of Fuchs have been repeatedly confirmed. A high leucocytic count has not always been found.

Despite the war statistics, it is dangerous, though perhaps justifiable, to try to save an eye which has received a perforating injury to the ciliary zone with a prolapse of any of the intraocular tissues, and should not be attempted if the eye is practically sightless and remains inflamed at the end of ten days.

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### ANGINA PECTORIS WITH LOW BLOOD-PRESSURE.

HALL, in the *British Medical Journal* of October 18, 1919, states that in the past it has been more or less assumed that high blood-pressure was an invariable concomitant of angina pectoris, but in recent years attention has been directed to the occurrence of typical anginal attacks in the presence of low blood-pressure. It was, however, possible that whilst the usual blood-pressure was low, the cardiac attack might be accompanied by a rise of pressure; hence the relief which was sometimes obtained in these cases from the inhalation of amyl nitrite. In his experience the victim of angina pectoris had usually a blood-pressure considerably above normal, and it was to an intensification of the already high pressure that an anginal attack was commonly due. On this occasion (a meeting of the Medical Society of London) he directed attention to those exceptional cases in which anginal symptoms occurred in patients who had in the intervals a systolic blood-pressure about or below normal. He had been struck by the failure of the drugs usually employed to give relief in these cases, and was convinced that a fatal termination might be accelerated if vasodilators were incautiously administered.

The prognosis, always grave, was distinctly worse when anginal symptoms occurred in patients with a low blood-pressure. The failure of nitrites to give relief in anginal pain was of bad omen, for it indicated myocardial degeneration and the tendency to death by sudden heart failure. He would insist that all indications of a failing myocardium—such as feebleness of the impulse, a feeble first sound at the apex, low blood-pressure, a feeble infrequent pulse, dyspneic attacks, swelling of the feet, and signs of commencing edema of the lungs—were of very grave prognostic omen, that these cases required a stimulating plan of treatment, and that vasodilators were useless, if not dangerous. Given in some cases of low pressure they might be tried, as they seem to lighten the burden of the heart. But in these cases vasodilators must be used with great caution and not pushed, as an undue lowering of the blood-pressure might be attended with disastrous results.

It had been suggested that if within a minute or two nitrite of amyl failed to give relief a whiff of chloroform should be administered. He was doubtful of the wisdom of this procedure, especially in cases of low tension, and would prefer to give morphine subcutaneously. As a general rule, angina pectoris occurring in patients with low blood-pressure required to be treated on different lines from cases in which it was associated with high blood-pressure. An ounce of brandy in hot water might be given, or a mixture containing spirits of ether, aromatic spirits of ammonia, compound tincture of cardamoms in camphor water; this might be taken every half-hour for three doses if required. In cases of threatened collapse ether (m. v) or camphor (gr. jss) in sterilized olive oil might be injected intramuscularly. In cases in which the chief symptom was pain, the only drug of any value was morphine in combination with atropine, which might be given in doses of ¼ to ½

grain subcutaneously. The application of hot fomentations or of a hot-water bag to the precordium often affords relief. If the feet are cold, hot-water bottles should be applied to them. In the intervals the patient should be dieted carefully, the amount of alcohol should be limited, and tobacco forbidden; excess in tea or coffee should be checked; dyspepsia and other conditions of lowered vitality should receive appropriate treatment.

Among cardiac tonics no drug was so generally useful as arsenic; it might be combined with iron if the patient were anemic. The addition of strychnine would help to improve the tone of the patient. Hall supported his contention by reports of five cases. He also indicated the necessity for distinguishing between true angina and pseudoanginal attacks occurring in neurotic individuals with low blood-pressure, and recorded a case illustrating this point. Pseudoangina was especially met with in excessive smokers. He had seen it occur in patients who had also abdominal angina.

In the discussion which followed Hall's paper, Morison said that in classical cases nitrites were of great value, but he doubted whether their action was peripheral, and regarded them as centrally acting stimulants. He questioned whether there was any etiological connection between high blood-pressure and angina. The cause of the pain was not known. He was in the habit of administering atropine, since he regarded angina as a variety of vagal inhibition of the left ventricle. Taylor suggested that angina may sometimes be concerned with the right side of the heart, and there might then be high blood-pressure in the pulmonary system. He agreed that amyl nitrite should not always be used, and with the treatment advocated by Hall for cases with low blood-pressure. He had also seen tincture of musk, the animal preparation, give great relief.

Lloyd spoke of the value of physical and psychical treatment. The patient should be placed in the position of greatest physical comfort, and his attention diverted, and no drug should be administered without good reason.

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### SIXTY-EIGHT CASES OF TYPE I PNEUMONIA, WITH SPECIAL REFERENCE TO SERUM TREATMENT.

TENNEY and RIVENBURGH, in the *Archives of Internal Medicine* for November, 1919, state that of sixty-one patients having the serum, thirty recovered by crisis, twenty-two by lysis, and nine died. To the thirty who recovered by crists a total amount of 8665 Cc. was administered, or an average dose of 288 Cc. Those ending in lysis received a total amount of 9010 Cc., or an average dose per individual of 410 Cc. To those who died 3200 Cc. were given, or an average dose per individual of 356 Cc.

In addition to the serum treatment, the general treatment was carried out. Each patient had 1000 cu. ft. of air space. The windows were open day and night, and on sunny days the patients were moved to the porch. Rather large doses of digitalis and whisky were used during the critical stage, and codeine was administered when a sedative was necessary.

The Rockefeller Institute states that the expected rate of mortality in this type of pneumonia where the serum is not used is 25 per cent. Their mortality rate with the use of the serum, in a series of 101 cases, was 7.5 per cent, using an average amount per individual of 250 Cc. The mortality rate in Tenney's and Rivenburgh's cases was 14.7 per cent. This higher death rate may be explained by a lower resistance to pneumonia in the colored race, the unfavorable season of the year, and the forced moving of troops from place to place. Miller and Lusk in their report on pneumonia at Camp Dodge state that among sixty-nine cases of type I pneumonia occurring in six months, in which no serum was used, the mortality rate was 2.8 per cent. They regret that they did not divide this series of cases into two

groups, giving one-half serum and the other half none.

Tenney and his colleague feel that this epidemic of type I pneumonia was caused by the close association of the men on the transports after being exposed to the inclement weather of Brest, as most of the cases developed on the boats or soon after landing.

They have used the type I serum in two cases of pneumonia with positive blood cultures, one with Streptococcus viridans and the other with type IV pneumococcus. Each patient received eight injections, after which the blood cultures of both were sterile and both recovered. This was done in desperation because of the death of three patients with positive blood cultures developing prior to these two.

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### INFLAMMATION OF MECKEL'S DIVERTICULUM AND INTESTINAL OCCLUSION.

The *New York Medical Journal* of October 4, 1919, in an editorial, calls attention to the fact that Meckel's diverticulum is a formation met with relative frequency —at least in children—between one in sixty to one in one hundred cases, according to various statistics. Other intestinal diverticuli may likewise be the cause of intestinal occlusion. The anatomical and physiological conditions in which the diverticulum is placed favor lesions of this organ and inflammation in particular. The diverticulum is often early in life the seat of a pathological process. The larger number of cases are met with in children. Among these affections the most common is occlusion of the intestine. One form is mechanical without any individual symptoms and comprises volvulus, invagination and strangulation by bands of adhesions. It is, consequently, impossible to make a diagnosis of the lesion in the majority of cases causing the occlusion.

The second form of occlusion may be called inflammatory on account of its origin; it is the final phase of long standing or recent inflammatory processes in the diverticulum of Meckel whether they are acute, subacute, chronic, or relapsing. Anatomically, the diverticulitis may be plastic, suppurating, with encysted peritonitis, or with general peritonitis, gangrenous or chronic. The microscopical lesions closely resemble the corresponding types of appendicitis. However, gangrenous lesions, as well as ultimate complications from adhesions, are more frequently found. Clinically, inflammatory occlusion undergoes its evolution in two phases. The first is the pseudoappendicular, the second phase that of occlusion. In the gangrenous or perforating forms of diverticulitis the second phase may be replaced by signs of pseudo-occlusion.

The symptoms belonging to diverticulitis are not definite and the evolution of the affection remains to be studied. As most characteristic may be mentioned: pain in the periumbilical region and the presence of a deep-seated mass or tumor in the same region; a high pulse rate and a relatively low temperature, the abdomen being soft and not distended, and remaining so for some time after the onset of the symptoms; and lastly, the presence of a congenital malformation, congenital tumor, or fistula of the umbilicus.

These symptoms are far from being characteristic, so that the diagnosis of an occlusion from a diverticulitis can only be made with some degree of certainty when the symptoms present in a given case do not really belong either to appendicitis, strangulation or invagination of the intestine. The only treatment is surgical. The abdomen should be explored as soon as possible, the cause of the occlusion removed, and, according to circumstances, simple resection of the diverticulum, resection of the intestine, or an artificial anus must be resorted to. In all abdominal operations, if an intestinal diverticulum is encountered it should be resected, because it is a permanent danger to a patient. Finally, if in a child a diagnosis of appendicitis is made and the appendix found

normal or offering lesions in no way proportionate with the marked clinical manifestations, the last few centimeters of the ileum should be examined in order to discover if there is an inflamed diverticulum.

## CHOLESTEROL CONTENT OF THE BLOOD IN VARIOUS HEPATIC CONDITIONS.

ROTHSCHILD and FELSEN, in the *Archives of Internal Medicine* for November, 1919, conclude: (1) In obstructive icterus due to stones, etc., the cholesterol content of the blood is markedly elevated, and bears a definite relationship to the intensity of icterus. (2) In conditions associated with hepatic disorders the cholesterol content of the blood is not increased and is usually reduced. The cholesterinemia is not proportionate to the amount of bile pigments present in the blood. (3) In the so-called hemolytic icterus, there is no increase of blood cholesterol.

[It is manifest that these conclusions if accepted have a bearing on diagnosis and treatment.—ED.]

## THE OIL ENEMA.

Under this heading the *Journal of the American Medical Association* of November 15, 1919, states that the indications for oil enemas might be thus summarized:

1. To soften feces, in constipation characterized by formation of hard scybala and that due to partial obstruction of the colon.

2. For evacuant action, in so-called "spastic" constipation, in pelvirectal constipation, and in any other form of constipation in which oral administration of cathartics is contraindicated by gastric disturbance.

3. For soothing action, in excessive colonic and rectal irritability. Herschell and Abrahams consider oil enemas, next to appropriate diet, the single most important method of treatment in colitis. They are also useful in proctitis.

4. It has been suggested that oil enemas might inhibit the absorption of toxic products. That the oil has the power of removing substances soluble in it is shown by the fact that it is passed dark yellow or olive green and of offensive odor. We have no definite knowledge, however, of the degree to which this property might be of clinical value.

The chief contraindication to oil enemas is diarrhea, mainly because, in this condition, the oil would not be retained for a sufficient length of time to be of use; although another objection against the introduction of saponifiable oils would be the possibility that excessive peristalsis might carry unusual amounts of intestinal juices far down the colon, the results of the excessive oil digestion being liable still further to increase the irritation.

For self-administration, the patient should have everything prepared before going to bed, so that he does not have to get up after having taken the injection. The bottle of oil is placed in a basin of hot water until it has acquired blood heat (100° F.). An ordinary fountain syringe might be used, provided the nozzle has a sufficiently large bore to permit the oil to pass readily. Though it is intended that the oil shall be introduced slowly, the bag usually has to be hung from 2 to 3 feet high owing to the viscosity of the oil, which makes it run rather slowly. The clip should be placed within easy reach of the patient. Having poured the warmed oil into the bag, the patient lies on the left side with a folded towel and a firm pillow underneath the buttocks. The nozzle is inserted into the anus, and the oil permitted to flow. Should the patient experience distress or desire to move the bowel, the flow of the oil is checked and the patient remains quiet until the desire has passed. It might then be possible to introduce an additional quantity of oil. It is usually best, however, to be satisfied with the introduction of an amount that can easily be retained. After a while the patient turns on the back and finally on his

right side, in which position it is recommended he should remain over night. A piece of absorbent cotton or a woman's sanitary towel or both may be applied to prevent accidental soiling of the bed, for the passage of flatus may be accompanied by a spurt of oil.

If the injection produces discomfort and interferes with sleep, it may be taken early in the morning and the patient might lie in bed for three or four hours afterward. It should be understood that, unless the oil remains in the intestine for several hours at least, satisfactory results cannot be expected.

The total quantity to be injected depends on the patient's ability to retain it. This is so variable that no definite figure can be stated for any one person. The principle to be followed is to have the patient gradually increase the amount injected on successive nights, until a satisfactory amount can be introduced and retained. The patient may not be able to retain more than 70 Cc. at first, but is likely to be able to take, in course of time, as much as 250 and even 500 Cc. When satisfactory results have been attained, the quantity introduced as well as the frequency of injections is gradually diminished. The injections may then be given on alternate nights, unless resumption of daily administration is necessitated by the patient's condition. Later on, enemas are given every third night, and finally only on the evening of the day on which the bowels were not opened. A single injection may cause daily evacuations for several days.

For children, the quantity injected may range from 50 to 150 Cc. For infants, 15 Cc. may suffice.

When the injection acts well, it is followed by a very soft stool in the morning. If the morning evacuation is not obtained, an enema of physiologic sodium chloride solution should be taken after breakfast.

In bed patients, administration in the morning would be preferable. When an attendant gives the injection, a colon tube and funnel are all the apparatus required.

In spite of its excellent theoretical foundation and the enthusiastic recommendation of numerous clinicians, this treatment is not very popular, probably because of the troublesomeness of the procedure, the annoyance, and the expense.

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## ACTION OF ALCOHOL ON THE HEART AND RESPIRATION.

HYATT, in the *Journal of Laboratory and Clinical Medicine* for October, 1919, summarizes the results of his experiments on the giving of alcohol to an unanesthetized animal as follows:

By mouth there is a rapid rise and an immediate return to normal. This is due to local action.

Intravenously: (*a*) Given gradually in quantities sufficient to kill in one to two hours, there is no effect until just before death, when a rapid fall of pressure takes place. (*b*) Given rapidly there is a sudden fall followed by an immediate return to the normal. There is no effect if the vagi are cut.

By stomach: When introduced by means of a stomach tube there is no effect.

When alcohol is introduced without excitement intravenously into the normal dog, there is no stimulation of the heart or respiration.

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## EXPERIMENTAL INVESTIGATION OF PITUITARY EXTRACTS AND HISTAMINE.

JACKSON and MILLS, in the *Journal of Laboratory and Clinical Medicine* of October, 1919, feel that the results brought out in their paper justify them in making the following conclusions:

The true active principle of the posterior portion of the pituitary gland is a simple body of the sympatho-mimetic amine type, which in the dog produces contraction of the uterus, but fails to contract the bronchi. With the other smooth musculature they are not especially concerned in this paper.

This is in all probability due to an action

of the substance on certain nervous elements and not to a direct muscular action.

Certain commercial preparations of the pituitary gland apparently contain very small and very variable proportions of histamine, and the amount of this substance is probably great enough in some samples to exert some therapeutic action. But it is in nowise a necessary constituent of first-class preparations of the posterior portion of the pituitary gland.

It is exceedingly probable that the action of histamine on the bronchioles of spinal dogs can be used as a commercial test for the presence of small amounts of this substance in ordinary commercial extracts of the pituitary gland. They presume that excised bronchial rings might be used as a very poor substitute for the method which they have employed.

If the findings reported in this paper are substantiated, then there are very obvious clinical advantages in favor of the pituitary extracts rather than of the very intense broncho-constricting and blood-pressure lowering histamine for obstetrical uses. But in all probability very small amounts of histamine would not be of any serious disadvantage in these preparations.

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### ENUCLEATION OF THE EYEBALL UNDER LOCAL ANESTHESIA.

HAYDEN (*Illinois Medical Journal*, November, 1919), in a paper read before the Chicago Ophthalmological Society, stated that local anesthesia, since Koller introduced cocaine, in 1884, had been the procedure *par excellence* in nearly the entire realm of ophthalmic surgery. To-day general narcosis was not uniformly employed in eye operations except on the very young and extremely nervous patients; in septic conditions, where injections might carry infection to other tissues; in extensive plastic operations; and in enucleations. In some of the last-named the use of chloroform or ether may be so dangerous to the life of the patient as to be almost absolutely contraindicated. Local anesthesia then becomes a matter of necessity. A most satisfactory result in a case of this sort prompted the presentation of his paper.

After detailing an interesting case in which he enucleated the eyeball under local anesthesia, he referred to the advantages, or indications, for local anesthesia in general:

1. Dangers and complications of general anesthesia are entirely eliminated. Among these are the immediate dangers, such as respiratory and cardiac failure, chloroform and ether poisoning and shock, as well as remote complications, such as postoperative and hypostatic pneumonia, myocarditis, nephritis, etc.

2. It is impossible to remove the wrong eye.

3. No preparation is needed, so that the operation can be done at once, and it is not necessary for the patient to be purged or starved.

4. No assistant is necessary.

5. The surgeon is relieved entirely of worry in regard to the patient's life.

The contraindications of local anesthesia are few:

1. Extreme youth or extreme nervousness on the part of the patient, the latter also probably on the part of the operator.

2. Purulent conjunctivitis and panophthalmitis, where theoretically a dissemination of the infection might result from injection of the anesthetic solution used.

3. Ruptures of the globe from panophthalmitis.

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### RAGWEED DERMATITIS.

In a discussion of a paper by Sutton on this subject in the *Journal of the American Medical Association* of November 8, 1919, SCHAMBERG stated that for several years he has been using the tincture of rhus toxicodendron to desensitize patients susceptible to ivy poisoning, and so far he has never had a failure. It is perfectly possible to keep the patients free from ivy dermatitis. He uses 1 Cc. of the rhus toxicodendron with 10 Cc. of alcohol, with some fluid

vehicle sufficient to make 100 Cc. He begins the treatment with one drop well diluted after the first meal, two drops after the second meal, and so on, until 20 drops are reached, and then for the purpose of simplifying the treatment he gives one teaspoonful, well diluted, once a day through the ivy season. The immunity seems to last for about one month after the last dose has been taken. It is very simple, does not disturb the digestion, and patients are able to keep themselves free from ivy poisoning in this way. He made brief mention of this at the session of the American Medical Association in Detroit, 1916, and since then he has had many cases and not one that was not protected. One patient was a young girl who was usually confined to bed for about three months of each year because she could not walk down a lane where ivy grew without becoming attacked. He has no doubt that other forms of dermatitis from poisonous plants could be prevented in the same way. He believes that others will agree with him that patients who are susceptible to ivy poisoning do, as a matter of fact, have certain periods of immunity. Patients do not have recurring attacks without a number of weeks of relative or complete freedom. He thinks it is quite well established that persons susceptible to ivy poisoning may be attacked with ivy dermatitis without actual contact with the plant. The effect of the treatment to which he refers is, after all, not to be prejudged by theoretical conditions, but by actual results obtained.

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### FACTORS DETERMINING THE RELATIVE INTENSITY OF THE HEART SOUNDS IN DIFFERENT AUSCULTATION AREAS.

WIGGERS, in the *Archives of Internal Medicine* for November, 1919, states that in his experiments the heart sounds over the apex region, aortic and pulmonary areas were recorded simultaneously, or in pairs, by the direct sound recording capsules described by Dean and himself. Changes in the intensity of any heart sound over a particular area were determined by comparing the amplitude and number of vibrations entering into that sound complex before and after modified conditions of the circulation were experimentally produced. He concludes that the intensity of the first sound is not related to the volume of blood discharged by the ventricles—*e.g.*, during slowing of the heart; when the systolic discharge is increased, the first sound is reduced in intensity.

The intensity of the first sound over all regions varies directly as the systolic tension developed within the ventricles—and, there is good reason to believe, with the tension developed during the isomeric period of systole.

The intensity of the second sound increases or decreases as the pressure (aortic or pulmonary) at the beginning of diastole.

When the pressures at the beginning and end of systole increase, particularly in one circuit and relatively little in the other, an accentuation occurs, predominantly in the sounds referred to the circuit in which the changes predominate.

In the circulatory conditions where the pressures at the beginning and end of systole vary in opposite directions in the greater and lesser circuits, the intensity of the pulmonary and aortic sounds changes in opposite directions.

Direct experimental evidence supplements the anatomical basis for believing that sounds heard over the second left i. c. s. are transmitted from the right heart and lesser circuit, while those heard over the right second i. c. s. and apex have their origin in the left heart and greater circulation.

When reserve and caution are exercised, a change in the intensity of the first sound over any area is good evidence of a change in tension developed during systole of the ventricles, while a change in the intensity of the second sound over the aortic and pulmonary areas may safely be used as an index of a change of pressure at the beginning of diastole in the greater and lesser circuits, respectively.

### TREATMENT OF CHRONIC COUGH.

In *American Medicine* for October, 1919, VOORHEES states that general tonics may be employed with good effect. Of these, strychnine is especially useful since it acts almost specifically upon relaxed mucous membranes.

We must also employ antiseptic agents with skill and sound judgment. Salts of silver—argyrol, protargol, silvol, solargentum—are all helpful if applied directly to the diseased area. They must be dropped directly into the trachea once or twice daily and coaxed into the affected bronchus through gravity, the patient lying down on the affected side immediately after the instillation. The oily antiseptics are at times very helpful: Menthol in oil, thymol, oil of cloves, etc., in from five- to twenty-five-per-cent solution, about one cubic centimeter being introduced at each sitting.

Recently we have had given to us through the work of Carrel and his associates the so-called dichloramine-T in chlorcosane oil. This is one of the most active antiseptics for chronic infections, and the only precautions one needs to follow are that the liquid be fresh, neither acid nor alkaline, uncontaminated by foreign matter, and that it reach the free exposed surface where bacteria are assumed to be. One should then control the progress of the case by making frequent bacteriologic examinations of the sputum to note what changes have taken place in the numbers, virulence, etc., of the bacteria.

One will fail in the treatment of these cases if he does not explain in the very beginning what he proposes to do, that the time of treatment will extend over many weeks, possibly several months, that one or two treatments must be given daily, and that only through the most strenuous and painstaking work can one hope to eradicate the bacteria and heal the lung. Treatment of such cases "by the visit" is hopeless. We must take the case as a problem to be solved and must demand that the patient be ready to submit himself to all the various laboratory, *x*-ray and other tests and procedures cheerfully and immediately whenever requested. Naturally a physician with a large practice of varying cases cannot give either the time or attention that these patients must have. He must aim to specialize in this type of case so that he can give his entire time and attention to them just as he would to a serious surgical condition. He must, in consequence, be paid a fair inclusive fee. He must not try to cut down on the number of visits, the necessary examinations, and the like.

If this routine is followed in detail it will bring no end of satisfaction to the patient, the physician, and all others concerned.

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### THE USE AND MISUSE OF FORCEPS IN LABOR.

BJORNSON, in the *Journal-Lancet* of November 1, 1919, states that in some of the older text-books on obstetrics there was given a definition of normal labor somewhat as follows, only much longer: "The child should be born alive by the unaided efforts of the natural forces, without any complication, in any of the three stages of labor within twenty-four hours of the onset of the true labor pains." This definition has always appealed to him as being very good; and, keeping it in mind, he has been impressed with the frequency of cases that do not conform to this definition. How often first labors, especially, depart widely from it; and yet in this country, where rickets is very seldom met with, difficult labor due to narrowing or deformity of the pelvis is comparatively rare. The same, to a certain extent, is true as regards cross-births, brow, face, difficult breaches, eclampsia, placenta previa; to mention only the most formidable complications.

But there are lesser complications that one frequently meets with, which, though by no means serious or insurmountable, tend to result in protracted labors, with more or less exhaustion of the mother and injury to the child; to overcome which often taxes the skill and resources of the attendant to the utmost. In this class come

cases of delayed labor due to failure of the head to enter the pelvic inlet, resulting from malposition, as when the occiput is posterior, or from disproportion between the head and the pelvis, and, lastly, from misdirection of the uterine force, as in cases where the uterus has become overdistended from hydramnios or multiple pregnancy or where the abdominal wall has become lax, due to overdistention or separation of the recti muscles. Here, instead of the uterine force being directed along the axis of the pelvic inlet, it is directed at an angle to it, so that pains may go on for hours and yet no progress be made.

After the head has descended into the pelvis there are yet conditions which result in delay. The most common of these is the posterior position of the occiput and disproportion between the head and the pelvis. How often do we find, even when the head is well engaged, that regular and strong pains go on for hours, and yet the head does not advance to any appreciable extent and we are compelled to interfere in the interest of both mother and child.

Then lastly we get cases where, owing to slow dilatation of the os, increased resistance, or obstruction to the advance of the head, the uterine force gives out, and the pains become less frequent and feebler and may even cease altogether. This is uterine inertia, which often calls for artificial intervention.

But before considering how each of these difficulties may be met by the use of the forceps he gives a few suggestions on the application of instruments. Before their use certain conditions must be present:

1. The head must present by the vertex.

2. The head should be engaged—that is, the greatest diameter should have passed the pelvic brim.

3. The os uteri should be fully dilated. Nothing in all obstetrics could be more pernicious than applying forceps and pulling the head through a partly dilated os.

4. The membranes should be ruptured and retracted over the head.

5. Uterine contractions should be present in sufficient force and regularity to insure detachment of the placenta and closure of the uterine sinuses, for otherwise a serious or fatal hemorrhage is likely to follow.

6. The occiput should be directed anteriorly. This last is not usually given in the text-books, but it is his firm belief that many of the difficulties of the forceps operation would be obviated if this rule were followed.

By keeping these conditions in mind and strictly adhering to them, the use of instruments will prove a much easier and more satisfactory operation. Sometimes, at the earnest pleadings of the patient to be relieved or at the vigorous behest of firm-faced relatives to "do something," one is led to disregard these rules and to attempt an ill-advised delivery by instruments, leading to more or less disaster to mother and child and, incidentally, to one's reputation. The premature administration of chloroform is also apt to lead one into error. For humanitarian reasons the attendant is sometimes coaxed into giving an anesthetic early in the second, or even late in the first, stage. A few whiffs usually suffice to abolish all uterine contractions, and the hapless attendant finds himself with a patient semi-narcotized, no pains, and the conditions justifying the use of forceps far from present. Here nothing remains for him to do but what practically amounts to an accouchement forcé: deliver by whatever means he can, an operation where muscular force plays the leading part.

To avoid this error it is well to adopt a fast rule never to administer a general anesthetic unless, if the pains cease, and the forces of labor are suspended, the conditions necessary for the use of forceps are present. If the pains are so great as to demand relief, morphine, chloral, or hyoscine is much to be preferred.

The type of forceps to use and the manner of their application are not a matter of indifference. An axis-traction forceps is much to be preferred. For many years he has used an instrument known as the Neville type, which is simply the

ordinary Barnes forceps with an axis-traction arrangement applied to the handles, near the lock, instead of to the fenestræ, by means of rods, as in the Tarnier or Mile-Murray type. They can be used as an ordinary forceps without the traction handles in low operations, or the handles, which are attached outside the vulva, can be applied if necessity demands. This is a very satisfactory instrument in every way, and it has been used in Dublin for many years in preference to the Tarnier.

In some countries it is the rule that a woman is delivered on her side, and whatever advantages this position offers in ordinary delivery apply equally well in the forceps operation, and once one has learned to deliver in the Sims position he will use no other.

The same is true of the surgical glove. Whatever the rubber glove has done for surgery it has also done for obstetrics. We all remember with what trepidation we put the ungloved hand into the uterus when occasion demanded, while now we do this with almost entire impunity. Since the advent of gloves he has noticed an almost complete disappearance of the postpartum chill, which was looked upon as a matter of course following obstetrical operations. Where the doctor of the old school was "wigged and gowned" our modern doctor should be gloved and gowned.

All text-books on obstetrics classify the forceps operation under high, medium, and low. By the high operation we mean cases in which, for reasons already given, the head has failed to engage in the pelvic inlet. Such experience as he has had with the high operation has been unfavorable, and this is in harmony with the later writers on obstetrical subjects, who strongly discourage or condemn it. Even with experience and ample assistance one should hesitate before attempting it. Before resorting to it one sometimes tries to push the head into the pelvis by suprapubic pressure. It does no harm, and sometimes succeeds. With a lax abdominal wall when the presenting part is driven in the direction of the promontory, instead of into the pelvic inlet, a good plan is to apply a tight abdominal binder between pains. It often works like a charm; the head enters the inlet, and as the patient is always a multipara the rest of the labor usually ends very quickly.

These means failing we then resort to forceps. For this operation an axis-traction instrument is an absolute necessity. To apply forceps to the head while still above the brim and giving a few steady pulls just to see what happens, in itself does no harm. Such a procedure is quite justifiable so long as one does not fall into the error of thinking that once instruments are applied labor must be finished that way at all costs. One soon learns to recognize the absolute immobility and absence of response to the tractions. After a few tentative pulls, remove the forceps and desist from further efforts. What, then, shall we do? The lone practitioner would most likely do a version, or, if help were available, craniotomy or Cæsarian section.

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## THE ROLE OF THE ANTINEURITIC VITAMINE IN THE ARTIFICIAL FEEDING OF INFANTS.

DANIELS, BYFIELD and LOUGHLIN, in the *American Journal of Diseases of Children* for December, 1919, state that the results of their investigations would seem to justify the following conclusions:

1. The addition of the antineuritic vitamine obtained from wheat embryo to the diet of babies supplied with food furnishing an adequate number of calories stimulated growth.

2. The beneficial influence of adding a specially prepared vegetable soup in sufficient quantity as part diluent in the milk modifications for infants is apparently due to the presence of the antineuritic vitamine contained therein. Both the alcoholic soluble material of the dried soup vegetables and the water extract (soup) stimulated growth.

3. The fact that the artificially-fed infant requires a larger amount of food than the

breast-fed infant appears to be due to the relative paucity of diluted cow's milk in the antineuritic vitamine.

4. It is probable that failure to gain in infants and young children is often the result of an insufficient amount of the antineuritic vitamine in the food. The diets of the young, we believe, should be more carefully scrutinized with this in mind.

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## THE TREATMENT OF ENLARGED OR DISEASED TONSILS IN CASES IN WHICH SURGICAL PROCEDURES ARE CONTRAINDICATED.

In the *Journal of Laryngology, Rhinology and Otology* for October, 1919, MOORE states it would seem that the time has now arrived when we may review this situation from an unbiased point of view and consider whether too much operating is really being done, and whether any satisfactory non-surgical procedure offers itself for those cases in which serious affections of the general health accompany the tonsillar disease and contraindicate surgical interference. He considers first those conditions in which surgical procedures are contraindicated, and in some cases a positive danger; next to discuss the various non-surgical remedies which from time to time have been advocated; and finally he draws special attention to those methods of treatment by which the enlarged tonsil may be satisfactorily dealt with. One method long overlooked and discarded he ventures to revive in the hope of reinstalling it in its proper position, viz., as a useful substitute and as the treatment of choice in certain cases in which radical operation is contraindicated.

The following are frequently considered as contraindications for the surgical removal of the tonsils:

I. Local:

1. *Acute tonsillitis.* Acute inflammations or infections due to the streptococcus, scarlet fever, measles, diphtheria, or in association with rheumatic fever, ulceromembranous tonsillitis (Vincent's angina).

2. *Physiological enlargement* of temporary character accompanying the four periods of dentition.

3. *Professional voice-users.*

II. General:

1. *Cardiac disease—e.g.,* endocarditis and pericarditis in association with or following tonsillitis.

2. *Advanced cardiovascular changes—i.e.,* in individuals who have a tendency to hemorrhages, and whose condition would be endangered by any sort of surgical procedure. (*a*) In constitutional diseases where anemia is very marked and where any loss of blood would be of serious importance to the patient's health—*e.g.,* in chlorosis, pernicious anemia, leukemia, and Hodgkin's disease. (*b*) Where there is a low coagulating power of the blood—*e.g.,* in true hemophilia, cholemias, purpuric diseases, etc. (*c*) Where the blood-pressure is over 225 systolic. (*d*) In arteriosclerosis.

**Moore's method of applying the caustic paste in the reduction of enlarged tonsils.**

3. *Advanced tuberculosis.*

4. *Syphilis,* particularly those cases with ulcerative processes.

5. *Kidney diseases—e.g.,* Bright's disease. Many cases have been observed in which nephritis has followed acute follicular tonsillitis.

6. *Advanced cases of diabetes mellitus* in association with acute follicular tonsillitis.

7. *Grave nerve or mental disease* in which marked excitation is present—*e.g.,* chorea, exophthalmic goitre, the maniacal state, etc. In a series of cases of exophthalmic goitre 79 per cent had accompanying enlargement of the thymus gland.

8. *Enlargement of the thymus gland,* either alone or associated with the "status lymphaticus."

*Silver Nitrate,* in varying strengths, 10 to 20 gr., or the fused salt on a probe applied to the surface of the tonsil or inserted into the crypts, has been used with varying results for many years for promoting sclerosis and reduction of the hypertrophied tonsil or for destroying the crypts. In addition to its astringent action it is said to possess the power of promoting absorption. It forms an insoluble compound with the albumen of the tonsil—an albuminate of silver—but its action is very limited, too superficial and too slow, hence it has fallen into disuse. Even with solid nitrate of silver it is so slow that it requires about six months to remove the tonsil by this process. Morell Mackenzie believed it seldom materially lessened the bulk or improved the pathological condition of the tonsil, and that when the tonsils were really hypertrophied the remedy must be of a destructive character and escharotics must be used. Goodale recommends that silver nitrate should be introduced not only into the crypts, but also by injection into the substance of the tonsils themselves by means of a hypodermic syringe. Eight to ten injections of a solution varying from 4 to 8 per cent are used at intervals of four days, resulting in a rapidly progressive symmetrical diminution in the size of the tonsils, until after ten injections they were one-fourth the original size.

Its effect "is theoretically in harmony with the normal process of retrograde metamorphosis of the organ by a sclerosis proceeding from the base of the organ to the periphery and leading to a symmetrical diminution in the size of the organ." He recommends the procedure in chronic inflammation of the tonsils where excision is contraindicated.

*Perchloride of Iron.*—The most effective mineral astringent is a solution of perchloride of iron 1 to 2 drachms with water or glycerin 1 ounce, painted over the tonsils once or twice daily with a brush.

*Mineral Acid Caustics—e.g.,* nitric, hydrochloric, lactic, trichloracetic and chromic acid—have been tried for the destruction of the enlarged tonsil, but the objection to their use is that they cause marked inflammatory reaction and it is extremely difficult to limit their action. They only act superficially and slowly.

*Acetic Acid.*—Morell Mackenzie stated that he had treated a few cases successfully by parenchymatous injections of dilute acetic acid (B. P.) with a curved syringe, but the treatment was slightly painful and required from ten to fifteen injections.

*Chromic Acid.*—In chronic hypertrophic tonsillitis when the crypts are diseased they may be cauterized with chromic acid crystals fused on a probe and inserted into the crypts, or the crystals may be melted and applied on a small, tightly wound, right-angled cotton applicator inserted deeply into the crypts. Donaldson of Baltimore had a good deal of success in reducing tonsils by making a small incision into the enlarged tonsil, and then holding a crystal of chromic acid in the cut for some moments.

*Alkaline Caustics.*—Attempts have been made with success to destroy the enlarged tonsils by means of powerful caustics. The alkaline caustics, such as caustic potash or soda, are preferable because their compounds with albumen are soluble in water, and they therefore extend their action

much more deeply into the tissues. They destroy the vitality of any tissue to which they are applied and reduce the size of any diseased mass by a piecemeal process of disintegration. There is a difficulty, however, in keeping caustic potash localized and away from the surrounding tissue. W. J. Smith overcame this difficulty by using a small platinum disc mounted on a handle on which he fused the caustic potash, which was kept in contact with the tonsil for a moment or two, the complete destruction being completed in six or seven sittings.

*Potassa cum Calce* (Vienna paste) is a non-official preparation of caustic potash, and consists of caustic potash 5 drachms, slaked lime 6 drachms, and rectified spirit sufficient to make a mass. Fournie of Paris in 1863 published particulars of 52 cases of enlarged tonsils which he had treated with Vienna paste. Three weeks was the average duration of the treatment, and in some instances only a fortnight was required, whilst in others it took a month. In one case, a child, aged four, four applications of the paste reduced the tonsils to their natural size. The results were satisfactory without exception in every case. The minimum time required in these cases to remove the tonsil was two weeks, the maximum one month.

*Soda cum Calce* (London paste) is analogous to the Vienna paste, but possesses many advantages over the caustic. It was first introduced in 1864 by Morell Mackenzie after his attention had been drawn to Fournie's work with the Vienna paste, and he employed it with very great success in a large number of cases. It consists of equal parts of caustic soda and hydrated lime mixed with a little alcohol. To this compound Mackenzie gave the name of London paste.

In this mixture we possess a most valuable therapeutic agent, for it possesses many advantages over the potash salt:

1. It causes no inflammatory reaction.

2. It penetrates rather than spreads circumferentially, therefore its application is more localized and the surrounding parts are not affected.

3. Its action is less severe and continues for a much longer time.

4. It causes much less pain—this, however need not be considered nowadays since the introduction of cocaine.

5. There is no hemorrhage.

6. There is no rise of temperature, no risk of sepsis, and no bad symptoms ever followed its use.

7. It may be employed in very young children.

8. The advantage of this paste over other caustics is that it is only necessary to keep it in contact with the hypertrophied tonsil for five seconds.

The attention of Moore was first drawn to this treatment fifteen years ago, and the favorable results obtained in a number of cases induced him to try it on others. The results in all cases ranging from childhood to advanced age have been most striking and of a very permanent character.

*To Prepare the Paste.*—A small quantity of equal parts of finely pulverized and well-mixed caustic soda and unslaked lime is kept on hand. This should be kept in a well-stoppered bottle, since caustic soda and lime have a powerful affinity for carbonic acid, and if exposed to the air the causticity of the paste is impaired or lost.

When an application is to be made to the tonsils a little of the powder is placed on a porcelain slab, a few drops of absolute alcohol added, and the two carefully mixed with a spatula, when the paste is ready for use.

Care must, however, be taken that the paste is of the proper consistency. If too thin it is apt to find its way to parts which ought not to be touched; if too thick or lumpy, the paste will not readily stick and little pieces might be swallowed.

*Application of the Paste.*—It is only necessary to apply the paste for a few seconds, the action of the escharotic upon the tonsil being very rapid. The mucous membrane almost invariably assumes a deep bright-red color followed by streaks

and patches of dark, blackish blood. The following day the tonsil is covered with a whitish-yellow slough. It should be re-applied after an interval of three or four days, and then twice a week. The number of applications varies from two to eight, according to the size of the tonsil and the amount of fibrous tissue present.

This escharotic not only actually destroys in successive layers a portion of the tissue by a process of disintegration but also devitalizes a subjacent layer, causing it to become soft and friable. During the devitalizing process the tonsil also undergoes general shrinkage. The largest tonsils have been reduced to normal size, whilst in the case of diseased tonsils there has been no blocking up or sealing up of septic crypts as may occur with the galvano-cautery.

The chief drawback to the employment of this escharotic in the past was the risk of a portion of the paste falling into the larynx, and is the probable cause of this treatment becoming obsolete and forgotten. Mackenzie employed first a rod of glass, a wooden stick, or an aluminum wire, whilst later he designed an applicator somewhat on the principle of the guillotine, which, however, was too clumsy, and likely to cause alarm to children or nervous people.

Again, considerable pain was caused by the application of this escharotic. These objections have now been overcome since the introduction of cocaine, and Moore has devised a special instrument with which the paste may be applied with perfect ease and safety.

This instrument consists of an oval, saucer-shaped receptacle attached to a handle. With this instrument a greater or less amount of the escharotic can be applied without any risk of any falling off; also contact may be absolutely confined to the part, and there is no interference with the adjoining tissues.

It is a consulting-room procedure, devoid of pain or bleeding if performed under the local anesthesia of cocaine.

That the use of chemical caustics in the treatment of tonsillar disease is by no means obsolete is shown from inquiries made as late as 1909 by George L. Richards, who found that amongst 125 laryngologists, 42, or about 33 per cent, still used them to a greater or less extent, amongst these being such well-known authorities as George A. Leland (Boston), Joseph C. Beck (Chicago), D. C. Green, Jr. (Boston), Thomas Hubbard (Toledo), William S. Anderson (Detroit), Dunbar Roy (Atlanta), J. Payson Clark (Boston), Gleason (Philadelphia), Chiari (Vienna), and others.

Otto Freer (Chicago) regards chemical caustics as the resort of the timid manipulator who shuns surgery because he is afraid to attempt it, but, as Richards remarks, "It cannot be said of the above well-known and distinguished operators that they fear the more radical operation."

Though the treatment by this escharotic paste can never be expected to take the place in suitable cases of complete removal of the tonsils by operative methods, yet experience has undoubtedly shown that it is a highly effective and valuable alternative in cases so frequently met with in which the risks of excision have to be seriously considered, or in which the radical operation is refused.

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## CARDINAL PRINCIPLES IN CARDIOLOGICAL PRACTICE.

LEWIS, in the *British Medical Journal* of November 15, 1919, states that the most frequent question which he is asked to-day in regard to cardiac cases is this: "Is there or is there not organic disease?" The answer must be "yes" or "no." It is a question which he studiously refuses to answer; it is a duty to refuse, and the duty, he thinks, of every medical man. The manner of the answer is dictated: "organic" disease is a disease in which there is structural change; the remaining cases are "functional."

The issue seems clear: Is there or is there not structural change? But the issue is not clear, nor is it useful; on the con-

trary it is mischievous. We must inquire the purpose of the question, the manner in which the answer is to be used. If, in diagnosis, the cases are divided into two groups—"organic" and "functional"—according as there is or is not structural change, this division and its meaning will not be respected; for while he is asked whether structural change exists or does not, the answer is read as "serious" or "trivial." It never has been shown, nor will be shown, that all instances of structural change in the heart are serious; it never has been shown or will be shown that affections in which the heart is suspected, but which are accompanied by no evidence of structural disease, are of trivial import. Yet such are the almost universal and instant assumptions as the affirmative or negative answer is given. The question is a concealed trap of our own setting. The answering of it is a prevalent cause of needless wrangling and heart searchings; the answer, when it comes, is a fertile source of misunderstanding and injustice. If there is no structural disease of the heart, it is usually true that the disturbance of the heart is not serious; but that does not mean that the malady from which the patient suffers is not serious; it may be extremely serious. The heart is a very susceptible index of health, and maladies which in the past have been regarded widely as trivial (functional), though primarily cardiac, are almost certainly not primary cardiac maladies, but as a rule disturbances of the heart secondary to disease elsewhere.

A sound knowledge of those affections which perturb without injuring the heart is essential in dealing with patients supposedly suffering from cardiac maladies. Three-fourths at least of the cases classed as cardiac at the present time are not primarily cardiac at all. Because the heart's action is disturbed in these patients, and because the most obvious symptoms and signs seem to point to the heart, that organ gathers to itself almost exclusive attention. In such cases it is not infrequent that clear signs of disease in some other organ of the body are entirely overlooked; in such cases it is frequent that less conspicuous signs of disturbance elsewhere are passed by. It is a sound rule in dealing with a supposed cardiac malady to search the whole body minutely for sources of infection when signs of such heart mischief as is known to upset the circulation are not forthcoming. The question, "Is there or is there not organic disease?" is not a necessary question. A man who is wise cares little whether he has structural change in his heart or not; the state, if it were wise, would be equally indifferent. Lewis places this statement in a context from which it is not to be removed. A wise man cares whether he is fit or not for work and if his prospect of health is good or bad; these are questions distinct from that under criticism. Here is an extreme illustration: A man has a scar in the skin of his leg and presents that leg for examination. Who cares that the scar constitutes structural disease? A man may have a similar scar on his pericardium or on the edge of his mitral valve, a healed scar which never has and never will cause him inconvenience, providing no medical man discovers in him the signs of it and misinterprets its significance. When we see the scar on the leg we want to know how the leg works; when we find the signs over the heart which *may* mean a scar in the heart, it behooves us to inquire how the heart does its work; that is the important consideration.

It will be perceived that Lewis has in mind the systolic murmur and its significance. A systolic murmur over the precordium tells little or nothing of a man's capacity for work or the advisability of his engaging in it; it tells us little or nothing of the man's prospect in life. He does not propose to enter here in detail upon the evidence for this statement, for time is limited, and he has somewhat recently written fully upon the subject. But he suggests to those who still experience misgivings in the presence of systolic murmurs that they should examine a series of healthy young

men, not, as is the custom, under conditions of rest, but after a few minutes of fairly strenuous exercise; they will discover that the healthy heart is not always so noiseless in its movements as has been imagined, and will, he thinks, be persuaded that systolic murmurs, soft, harsh, or conducted, are natural phenomena when the organ is accelerated by exercise. They will find in these young men precisely the signs which have been used widely during the period of the war as evidences of "organic" disease of the heart, which have led to so many improper rejections of recruits, to so many improper discharges from the service, and now form the basis of many unnecessary or unnecessarily high pensions.

The other side of the picture shows men who are genuinely distressed when they exert themselves in any way, but who, presenting no cardiac signs other than those of a supposed "functional" condition, are dealt with casually or cavalierly. Thousands of these men were unwisely accepted as recruits; thousands more acquired their symptoms during service; and to the last group now belong many who, being regarded as "functional," suffer the innuendoes which that term frequently conveys, and receive as a consequence unjustly small pensions.

Pick up an old, or modern, text-book of general medicine and we will find diseases of the heart classified. With one of the chief groupings he has dealt. A subgroup of structural disease is that of valvular disease, and this subgroup receives an emphasis to which it is by no means entitled. At the present day, if one asks graduating students directly, if one inquires less directly of medical practitioners, what varieties of chronic heart diseases are recognized, the enumeration will almost always begin in the same way. There are four conditions which stand out in their minds; they are "aortic incompetence," "aortic stenosis," "mitral incompetence," and "mitral stenosis." As often as not the list begins there and ends there. Ask what cases lie in the wards of a hospital and, if there are serious heart cases, these are the conditions which will be most frequently named. Now these conditions are not diseases at all; they are descriptions of the events at two of the valvular orifices of the heart; they are dependent on disease or imperfection of these valves. To the names as such there is no objection; the objection is to the manner in which they are used. The terms are regarded individually as sufficiently descriptive of many a patient's case; actually each is wholly insufficient from this point of view; *a fortiori,* the term mitral incompetence is insufficient. If he states that he has under his care a patient who suffers from mitral incompetence, we cannot conceive whether the patient is engaged suitably in his every-day occupation or whether he lies moribund; we cannot tell whether his prospect in life is good or is bad; we cannot judge whether he requires treatment or not. The term, used in a diagnostic sense, conveys little or nothing of the facts of the case. "Mitral incompetence" constitutes a diagnosis by fashion only. Precisely the same remarks apply, though somewhat less forcibly, to the remaining terms.

A classification of heart disease of this kind has but a minor value for purposes of description, or for guiding prognosis or therapy. When medical men are so imbued with the supposed significance of valvular disease as to regard its diagnosis as the chief end point of the examination, then valvular disease occupies a grossly exaggerated position in their thoughts. Such, unhappily, it possesses in the minds of many, he would say of the majority of medical men to-day. How often is astonishment expressed when a patient comes for examination (or to autopsy) with dropsy, or a greatly enlarged heart, and no disease of the cardiac valves! The reiteration of such surprise is in itself remarkable. Grave disease of the heart, in the absence of disease of the valves, is extremely common in the elderly; it is also common enough in the young.

There is another curious way in which

the emphasis of valvular affections leads to grave misconception. Lewis has said that the named conditions of the valves are not diseases at all; yet they are commonly regarded as such by those who fail to reflect. Many intelligent students and graduated men are so misled by these terms that they come to regard the presence of two such conditions as constituting a double disease. The terms "double aortic," "double mitral" are sufficiently commonplace to bear witness to this tendency. Nevertheless, there is in these patients but one lesion of the valves. Loose speech of this kind consorts with loose thinking; the use of the adjective "double" conjures up a grave prognosis. Heedlessly, a man who presents aortic stenosis, and its almost invariably associated regurgitation, is regarded as a much more serious case than is he who presents regurgitation alone. He knows of no evidence that this is so. The presence or absence of stenosis in a patient who shows regurgitation is certainly not a prime factor in arriving at the prognosis, it is at the most a very subsidiary point. The misconception is even greater when the mitral valve is in question. Often, after a diagnosis of stenosis of the mitral valves has been made, the doctor's expression grows ominous as he detects a systolic bruit. In point of fact, the detection of this second murmur adds nothing whatsoever to the seriousness of the prognosis; that it does is nevertheless a very common belief. It is a belief due to lack of reflection; there are good grounds for the view that stenosis of this valve is always accompanied by regurgitation. Might we not even argue in general that the greater the stenosis the less in all likelihood is the regurgitation? But it serves no good purpose to argue such matters, the practical test of those who watch the progress of these cases shows that the point is entirely subsidiary; so, incidentally, is a systolic apical murmur in a patient who has disease of the aortic valves. Detect mitral stenosis and we need waste no time inquiring into the question of incompetence; there are far more serious matters to weigh. At the present time cardiac prognosis, as it is widely practiced, is perilously near to counting murmurs and assessing the gravity of the outlook in proportion.

Both for prognostic and therapeutic purposes there is value in ascertaining lesions of the aortic and mitral valve. Speaking quite broadly, there are two conditions of these valves which it is imperative should be recognized whenever it is possible; they are mitral stenosis and aortic incompetence. To recognize stenosis of the aortic valves when regurgitation is known to exist, to recognize incompetence of the mitral valve when mitral stenosis is known to exist, does not advance us materially. To diagnose aortic stenosis in the absence of signs of incompetence is outside the province of general practice; it is for every one a hazardous undertaking. To recognize that mitral incompetence is present, while mitral stenosis is not, is a task fraught with not inconsiderable difficulties; furthermore when it is done, it gives little or no aid when we come to the prophecy.

In brief, in dealing with chronic heart affections, there are but two conditions of the aortic and mitral valves, there are but two common conditions of any heart valves, which will repay a general physician for the expenditure of much time and thought; these are incompetence of the aortic valves and stenosis of the mitral valves. Both these conditions may usually be diagnosed with confidence, for it is their habit to present signs of an unequivocal nature. This is of high importance; a step taken with certainty is of far greater value than one taken even a little less confidently. A prognosis is too important a thing to mold on anything but a secure basis.

The comparative importance of these diseases of the aortic and mitral is to be emphasized from a second standpoint—the diagnosis carries conviction of an inflammatory or degenerative lesion of the heart. When we know that a patient has a regurgitant current of blood from aorta to ventricle, or when we know that the cur-

rent is obstructed between left auricle and ventricle, we have learned something of extra burdens which the heart muscle must bear in its work. Nevertheless, that knowledge is outweighed by a further conclusion which may be formed for practical use. It is that the heart as a whole has been exposed to and has probably suffered damage; it is safe to assume for practical purposes that when these valvular lesions exist the muscle of the ventricles is in greater or less degree faulty. There are some exceptions to this rule, but these are comparatively rare; one of the surest ways of diagnosing a faulty myocardium is to diagnose it in those who present mitral stenosis or aortic disease, and to diagnose it purely on the knowledge that these valve lesions exist; especially does this statement apply to aortic disease. It is Lewis's confident belief that, had systolic murmurs and modifications of the heart sounds never been discovered, the practice of the profession would have stood on a much higher plane to-day than it actually does. (He does not say that it *must* have stood higher, but that it *would* have stood higher.) As these signs are used by medical men in general at the present time, they are productive of infinitely more harm than good. They are not useless signs, but they are signs frequently misinterpreted; their value is limited. When a police officer on his night round spies an open window, it behooves him to inquire; he is unwise to conclude that there is a thief in the house. These cardiac signs are hints to us, useful guides to possible local mischief; that is their proper status in an examination, but it is not the status which they have.

Prognosis in cardiac affections, as it is generally practiced to-day, is pitifully inaccurate; because that fact is generally recognized it is equally difficult; what is not understood is that far greater accuracy is easily within reach. Accuracy, or, more strictly speaking, comparative accuracy, is regarded as unattainable; that is chiefly so because the broad principles and the outstanding facts have been lost to vision in a cloud of relative trivialities. Methods of examination, some useful enough in their proper sphere, many more of very dubious value, have been introduced. The subject as it is written and expounded has grown inordinately in complexity and the landmarks have vanished. Because a physician has possessed himself of an electrocardiograph, a polygraph, an *x*-ray machine, a blood-pressure instrument, or some ingenious form of stethoscope, it does not at all follow that he has become competent to judge a patient's condition; not infrequently the very reverse is the case, for more often than not the limitations of these devices are far from being comprehended. In this opinion he is at one with the recent pronouncements of Sir James Mackenzie. The signs which foretell favorably or the reverse can be elicited at the bedside by simple means, and the devices to which he refers had far better be left untouched than handled, as they often are, improperly.

The remedy, so it seems to him, which alone remains to the general practitioner to-day is simple but drastic. It is to fasten on to certain cardinal points and seriously to study their values—to take these cardinal points as a basis of every-day work and for the moment to discard what remains. It is to adopt a simple and broad scheme and to obtain a full knowledge of that scheme by applying it to patients; to disdain more comprehensive and flattering plans, of which at the most a mere smattering can be acquired; to work with those instruments which are always at hand and familiar; to become expert in the use of simple means, rather than indifferent manipulators or puzzled worshipers of instruments wholly or partially beyond general comprehension; to start from an assured basis and to build from that slowly and steadily. Lewis comes now to what he holds to be the cardinal points in the daily examination of chronic affections of the heart, and he places first and foremost the symptoms and signs of cardiac failure. These are subdivided into two categories:

The early evidences of an impaired cir-

culation are constituted by the symptoms which produce distress on exercise, and the three chief are fatigue leading up to exhaustion, breathlessness, and pain. In all patients, whether they are the subjects of actual or supposed cardiac disease, to know the tolerance of physical work is more than half the battle in arriving at a correct estimate of the case. A knowledge of the body's reaction to exercise in health, in ill health, and in the chief forms of heart disease is paramount. Lewis says he does not mean the rise and fall of pulse-rate or of blood-pressure; they are of service, but those who measure the reaction in this way almost completely fail to appreciate the essential, which is to know the amount of work which must be undertaken to bring forth *distress*. This method is of such importance that he emphasizes it by the following considered statements.

No man is competent to manage affections of the heart who has not a thorough grasp of this method, a method which is within the easy reach of every medical practitioner. He may have made an exhaustive study of electrocardiography, polygraphy, blood-pressure, percussion, the stethoscope, and what not; as a practitioner he is better without that knowledge if the first knowledge is lacking.

Standing by itself the method is of more consequence than the remaining cardinal points which he names. That is so because no patient who has a normal exercise tolerance has grave heart disease, and because the gravity of the disease in a series of real work more nearly than it is to any other heart cases is proportioned to the degree of distress produced by a given amount of observable phenomenon within our knowledge.

The signs of cardiac failure of the congestive type require no description beyond the statement that he refers to cyanosis and to engorgement as observed in the veins of the neck and the liver. The exercise tolerance is never normal or near normal when these signs are present; they are late signs. When signs of failure appear the disease is in an advanced state.

As to the signs of cardiac enlargement and its degree, without attempt to differentiate dilatation and hypertrophy, these are not discussed in detail, but Lewis asserts that palpation ranks before inspection and percussion, and that the chief sign is the position and extent of the maximal thrust and the structures it involves.

The signs of valvular disease comprise (*a*) signs of aortic regurgitation, which are obtained reliably as often at the pulse as at the base of the heart, and (*b*) signs of mitral stenosis, of which but two are valuable—namely, a diastolic thrill in the apical region and a diastolic rumble of low pitch, audible over the maximal thrust, and best heard, often only heard, in the recumbent posture after the action of the heart has been accelerated by exercise.

The presence or absence of fibrillation of the auricles is an important point to be recognized. If the heart is beating irregularly it should be ascertained whether fibrillation of the auricle is present or not. To obtain the last knowledge a few simple tests nearly always suffice.

(*a*) If there is constant quickening of the pulse during deep inspiration, fibrillation is not present.

(*b*) If the heart beats at a rate of 120 or over, or can be induced by any means to beat at such rates, *while the pulse remains irregular,* fibrillation is almost certainly present, and the faster the rate attained the more certain the diagnosis.

These tests are not exhaustive, but they are sufficiently so for general practical purposes. The remaining disorders of cardiac rhythm, either on account of their comparative rarity or because their significance in treatment is far smaller, cannot be regarded as cardinal.

No examination of the patient is complete until the presence or absence of infection has been fully considered. The chief signs are:

(*a*) Pallor, especially when accompanied

by sallowness or duskiness of the facies. This sign is of particular value in cases of aortic disease. Pallor in these cases is of ill omen.

(*b*) Palpable enlargement of the spleen, which is not a reliable sign of engorgement of the viscera, but is usually a sign of active infection of the valves in cardiac cases.

(*c*) The presence of small petechial hemorrhages in the conjunctivæ, buccal mucous membranes, or in the skin around the base of the neck and shoulders. They are far more frequent than has been suspected until recently, and should be searched for repeatedly in all sallow cardiac patients.

(*d*) Clubbing of the fingers, which when slight is, so Lewis is inclined to think, more frequently accompanied by infective endocarditis than by venous engorgement.

(*e*) The presence of fever, constantly or only from time to time.

(*f*) A pulse rate constantly over 90 or 100 while the patient rests and the pulse is regular.

(*g*) Gradual but steady loss of weight.

Signs (*a*) to (*e*) are more especially signs of infective endocarditis, a condition which in its subacute and chronic forms is much more wide-spread than is commonly believed, and terminates the lives of a goodly percentage of all cases presenting aortic regurgitation or mitral stenosis; signs (*f*) and (*g*) are also yielded by intoxications.

As to the etiology of the heart trouble, it may be of rheumatic, syphilitic, or of other infective origin, or it may result from senile changes. The etiology will control prognosis and treatment in no inconsiderable measure.

These are to Lewis's mind the cardinal points, for in his experience the great majority of all cases of chronic affections of the heart may be summed up efficiently and sufficiently in terms of them. In routine work instrumental examinations prove useful in checking or revising the bedside tests, but are essential only in a very small percentage of the patients; they prove in practice to be subsidiary methods of examination.

The value of the cardinal points is scarcely to be overestimated. Lewis asserts that no patient possessing a normal capacity for exercise has grave heart disease; if his tolerance is normal, but he presents cardiac enlargement—considerable cardiac enlargement is always accompanied by a reduced tolerance of exercise—mitral stenosis, or aortic disease, there need be no immediate anxiety. In very rare cases fibrillation of the auricles or a congenital malformation may be seen in patients in whom exercise provokes no undue distress; in these cases also the prognosis is favorable. If a patient presents none of the symptoms or signs falling under the first three headings—that is to say, if he takes exercise without undue discomfort, has no cardiac enlargement, no aortic disease and no mitral stenosis—and his doctor tells him on that basis that his heart is sound, this opinion will be justified in all but very exceptional instances, and the chief exceptions are the rare cases of fibrillation of the auricles and of congenital heart mischief and rare instances of paroxysmal tachycardia. Even in such cases the blunder would be a minor one, it would be a blunder of less consequence than gravely to warn a patient solely on the basis of a systolic murmur.

Briefly, the first three cardinal points are those which command consideration first; the last three assume cardinal importance in cases in which, on the basis of one or more of the first three points, disabling heart disease is already diagnosed.

Lewis then considers the value of exercise tolerance in the diagnosis of a deficient or overburdened myocardium. He attempts to formulate the following every-day rules which in his experience are at present sound:

(*a*) Where there is definite enlargement, or aortic disease, or mitral stenosis, or fibrillation of the auricles, then the safe course for doctor and patient is to attribute

any undue distress on exercise to a cardiac lesion.

(*b*) In young subjects, if there is no such immediate evidence of heart disease as above, then a deficient exercise tolerance should rarely, if ever, be ascribed primarily to the heart. To this class belong almost all patients who are supposed to be suffering from "heart strain," and a large number of patients incipiently infected with tuberculosis or chronically infected by pyogenic organisms.

(*c*) In elderly subjects, if there is no sign of structural disease, but a poor tolerance of exercise, the heart cannot be declared free of disease; on the contrary, the heart should be regarded as the probable seat of mischief. It is of course to this class that many cases of grave angina pectoris belong; but it also comprises many myocardial cases, in which the chief symptom is not pain but breathlessness or undue fatigue.

The cardinal principle in treating chronic heart disease is suitably to regulate the physical strains thrown upon the organ. When structural disease exists it is for the most part incurable, and as such it should be recognized. When, as an accompaniment of the minor forms of disease—for example, suspected scarring of the mitral valves—the capacity to exercise is unimpaired, there is no need to curtail the patient's energies. But if structural disease is judged to have limited the heart's reserve power, because effort is followed by undue breathlessness, by undue fatigue or by pain, then the patient's activities, in work and in play, should be controlled; they should be so regulated that such symptoms of distress are not provoked.

It is not often good practice to limit the activities because some physical sign other than a sign of distress is discovered.

It is not good practice willingly to allow a cardiac patient to call forth his whole reserve, and consequently to suffer pain, undue breathlessness, or fatigue. Those acts, strenuous or leisurely, which bring distress are to be prohibited; in one case strenuous games or heavy labor, in another case quick movement on stairs or road, in another the act of standing, in another unnecessary movement in bed, is to be forbidden, according as much or little exertion provokes symptoms. A cardiac patient is unfit to be on his feet if, when up, he becomes breathless, experiences cardiac pain, or quickly tires. The presence of symptoms in a cardiac patient when he stands at rest or moves leisurely is the first and chief indication of bed treatment. Cardiac patients who are breathless while in bed are usually very gravely ill, and in these it is necessary to try with all our means to reduce the work they do by waiting on them hand and foot. A very important consideration in such patients is to induce long hours of sleep, for during sleep the greatest measure of rest is obtained.

There are three indications which call for the bed treatment of cardiac cases. The first and most important is that distress is caused by the act of rising to the feet or by walking leisurely. The second is that active infection is thought or known to be present. The third is that drastic treatment with a drug of the digitalis group is required.

The chief value of digitalis lies in its power to control the ventricular rate when fibrillation of the auricles has come. In most patients in whom this disorder of the heart is discovered the ventricles beat rapidly, at rates of 120, 140, 160, and even more per minute. It is this rapid action which fatigues the heart, and digitalis, by lessening the rate, lessens the fatigue. The normal heart rate, while the body is at rest —to take approximate and convenient numbers—is 60 beats to the minute. Each ventricular cycle lasts one second; of this, one-third is occupied by systole, two-thirds by the resting period of diastole. The heart works one shift and sleeps for two. But if the rate is 120 beats to the minute, then each cycle lasts half a second; systole lasts a quarter of a second and so does diastole. Work and rest alternate in equal shifts. As

the rate of beating rises, so is systole increased relatively at the expense of diastole. Very important is it, therefore, to reduce the heart-rate where this is excessive. A chief cause of rapid heart action where heart failure threatens or has come is fibrillation of the auricles, and it is in this condition that digitalis acts so beneficially; it reduces and holds the rate within normal bounds.

The reduction of accelerated ventricular rate is the only important action of the drug upon the human heart of which we have knowledge. There are few, if any, instances of which we know with certainty in which digitalis acts beneficially, except cases of accelerated action; there are few instances of acceleration in which the drug produces unquestionable benefit apart from those provoked by fibrillation of the auricles. The principle of digitalis therapy—and when he speaks of digitalis he includes the allied drugs, strophanthus and squills—is that, administered to suitable cases, the heart, by means of it, obtains rest. The giving of this drug to unselected cardiac cases is much to be deplored. Those who regard digitalis as a cardiac stimulant mistake its character; its chief action is to rest the heart. To the heart foxglove is not tonic, but powerfully hypnotic. It extends the diastoles of the heart; it extends the period of sleep.

There is a direction in which medical men are much hampered in dealing with chronic heart disease. It is in trying to order the future lives of working-class men to suit the heart's power of reserve. Many cardiac patients leave our hospital wards after a short period of rest, a period during which there has been much improvement of the heart's capacity for work. Yet these patients are but too often totally unfit to take up again those daily tasks in and by which they have already suffered. To tell a working-class man that his former work suits him ill, to tell him that he must find new work of lighter grade, is good enough advice; but how often is it within the man's power to act on that advice? how often is it within the doctor's power to see that his advice is followed? We greatly need a system by which disabled workers are placed and cared for in suitable employment. Cardiac cases are for the most part conspicuously willing workers, frequently too willing; there are many men doing heavy work in the country to-day, and at the same time surely, but maybe slowly, dying of heart disease. It is a shameful thing that these unfortunates are put by hard necessity to tasks far beyond their endurance.

Work is good for cardiac cases, as it is good for men in whom the voluntary muscles of the body are ill conditioned, but only such work as falls well within the bounds of the heart's reserve is beneficial. It is a most important matter, and a matter very little attended to to-day in hospital practice, to test a man's capacity for work before he goes to his home; it is not sufficiently understood that discharge from hospital is read by many as a sanction to return to the old work.

As infection is the chief cause of heart disease, in the stage of its inception, and in the stages of its advance, so, when we come to treatment, to stay the advance by removing the cause is a chief principle. The treatment of early syphilitic lesions of the heart by appropriate measures is a field as yet little explored, but one which is in promise fertile. To treat drastically local invasions by pyogenic organisms is clearly indicated, and of proved benefit in many cases. Even more important is it to guard against infection. Cardiac cases run very serious risks, risks which but too often cannot be avoided, by contact with those suffering from some infection of the respiratory tract. Nevertheless, much harm may be avoided by timely warnings of dangers, met in the family circle, in crowded buildings and in ill ventilated rooms, by the prescription of the open air régime, and, in bed cases, by rigorous separation from febrile cases.

## THE ROUTINE MANAGEMENT OF DUODENAL ULCER CASES.

In *Northwest Medicine* for September, 1919, LEMON states that only after consideration of the results of clinical, laboratory, and *x*-ray examinations can it be determined whether medical or surgical means should be advised in duodenal ulcer. In a most painstaking and minute manner Sippy has outlined his method of medical management, worked out by long and extensive clinical experience. He gives only six indications for surgical intervention:

1. Secondary carcinoma.
2. Perforation into the free peritoneal cavity.
3. Pyloric obstruction of high grade due to indurated tissue narrowing that fails to yield to medical management.
4. Perigastric abscess.
5. Hour-glass stomach.
6. Hemorrhage.

Sippy states that the cases of pyloric obstruction that do not yield to medical treatment embrace only 10 per cent of the cases of obstruction, that the remaining 90 per cent are due to "pyloric spasm, acute inflammatory swelling, and in some instances local peritonitis, and that the obstruction disappears during the first two or three weeks under the influence of medical treatment." Operation is only infrequently necessitated by hemorrhage associated with duodenal ulcer. All cases not included in one of the six classes named are treated by medical management, the essentials of which are the maintenance of the absence of acid and consequently the prevention of corrosion. The details of the treatment—that is, the frequent meals, the alkali interval, the aspiration to determine acidity, the daily stool examinations, and the long preliminary confinement to bed, followed by many weeks of rigid adherence to the management—are too well known to require further comment. Sippy finds that:

1. Patients under medical treatment do well subjectively.
2. The management must be long continued and repeated.
3. Blood will disappear from the stool within ten days except in cases of malignancy.
4. The pains of obstruction, the nausea and vomiting disappear within a few days except in cases of cicatricial stenosis.
5. Acidity can be maintained at whatever level is desired.

Since the surgical examination of these cases has proved that they heal spontaneously only in rare instances, the disadvantages in such routine treatment are manifest. In this connection Moynihan states: "Relief of an attack in a case of chronic duodenal ulcer is easy; a cure of the condition by medical means is, I believe, almost impossible." And again; "The lesion found is of such a nature that anything other than surgical treatment is not worth considering. It is safer, speedier, and more certain than any other mode of treatment."

After a period of serious symptoms lasting for some weeks the patient with duodenal ulcer may have complete relief, and yet, if operated on during the quiescent period, the ulcer will almost regularly be found open and unhealed. The supposed cures of chronic ulcers of the stomach and duodenum may be compared to the supposed cures following each attack of recurring appendicitis or gall-stone disease.

The unprejudiced observer, he believes, must come to the conclusion that operative relief in cases of calloused ulcers of the stomach and duodenum is indicated after a reasonable amount of medical treatment has failed to produce a permanent cure. It has been his experience at the Mayo Clinic that patients who have grown weary of being so often "cured" medically come for surgical help. At operations done in many cases within only a few weeks of the completion of a rigid medical management, and at many operations performed during the remission of symptoms, an active ulcer was found. The remission in the latter case represents the "normal" resting place; in the former it is artificially produced. It is Lemon's practice in the very recent cases to

ask the patient to undergo medical treatment and to give the ulcer the best opportunity possible for spontaneous healing. Long-standing ulcers, he believes, do not heal and should be surgically treated to remove the danger of hemorrhage and of perforation.

A comparison of the results of medical and surgical treatment may be gained from the following deductions:

1. Eighty-one per cent of patients with duodenal ulcer operated on at the clinic were so much relieved that they could be considered cured, and 10 per cent were markedly benefited.

2. Acidity is reduced by the mechanical hooking up of the jejunum with the stomach, because it allows the alkaline secretion of the duodenum to flow into the stomach and neutralize its acidity. (In the series of 200 cases that he has studied this has been found to be universal and the average reduction in total acidity 39 per cent, in free hydrochloric acid 46 per cent.)

3. If patients are to remain well they must have focal infections removed. Patients who are not improved or those with gastrojejunal ulcer, except those in whom operative technique has provided a mechanical cause (Mayo, Carman, and Balfour)—these usually show a high grade of neglected oral sepsis, even when most urgent advice had been given at the time of operation.

4. Operation reduces to the minimum the danger of perforation and of hemorrhage.

Because there are patients who do not improve when treated only by surgery, every patient should be advised with regard to postoperative care until permanent cure is assured. Acidity has been reduced mechanically; it may be kept at a minimum by medical management. Every patient should be informed after operation as to proper diet, the basis of which should be milk, cream, eggs, vegetables, purées, gelatin, scraped beef, bread and butter, jellies, custards, and creamed foods; later other lean meats and broths may be added. The patient's weight must be watched so that loss may be prevented and diet kept up to the bodily requirement. By such dietetic control and by the use of alkali in suitable doses the acidity can be accurately controlled when only three meals a day are taken. It is Lemon's practice, however, to advise a morning and an afternoon lunch, consisting usually of a glass of milk and a cracker, at least during the first few weeks of convalescence. This is productive of good results and will increase the chances of the surgically treated ulcer patients to regain and to maintain normal health. Only patients who were not given the usual advice have complained postoperatively. Operation for duodenal ulcer cures in most cases, and it improves in almost all. Clinicians must do their part by postoperative advice to help obtain the best results from the operation.

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## THE CHOREA OF CHILDHOOD, WITH SPECIAL REFERENCE TO ITS TREATMENT.

BURNET, in *The Prescriber* for October, 1919, states that the treatment of chorea as generally carried out consists in keeping the patient in bed, and prescribing arsenic in increasing doses. This rule-of-thumb method is unsatisfactory in the highest degree. The following is the treatment as it ought to be carried out in every case, no matter how apparently slight it may be. We have constantly to bear in mind that chorea itself is rarely dangerous, but its liability to cause serious heart mischief constitutes its gravity. Treatment may be considered best under the following five headings:

1. *Rest in bed.* The patient must be put to bed between blankets, and kept there for six weeks at least. The child must be kept amused with suitable books and toys, but no excitement must be allowed. Noisy brothers, sisters, and companions must be kept out of the sick-room. If the movements are severe, the limbs may be wrapped up in a light covering of cotton-wool so as to prevent injury. The head can also be

protected in a similar fashion. The heart must be carefully examined at every visit. Every child suffering from chorea will be found to have dilatation of the heart, while many cases will show more definite signs of endocarditis. Burnet would warn against the tendency to be satisfied with auscultation only of the heart. Percussion will often yield evidence of heart affection when auscultation would reveal nothing abnormal.

2. *Diet.* This must be light, and suited to the powers of the patient's digestion, which is often impaired. Milk, so often recommended, is not altogether ideal, as when boiled it aggravates constipation or induces it. It is better to use some food, such as Mellin's or Horlick's, and give this with milk. The milk is thus rendered more palatable and more digestible for the child. Benger's food is also suitable. Eggs, butter, milk, puddings (*e.g.,* sago, farola, ground rice), soups, fish, chicken, and even minced mutton, are all suitable articles of diet. Marmalade is better than ordinary jams. As the child improves, fat bacon, well frizzled, is a useful addition to the diet. Porridge is usually the best breakfast dish, and is practically always suitable. If ordinary oatmeal is not well borne, oat flour may be substituted.

3. *Massage.* It is curious how little this is employed in cases of chorea. The child is allowed to lie in bed, while its limbs get weak and the muscles waste. In such cases massage is a very important part of the treatment, and should be carried out in every case. It often helps to diminish the severity of the movements. The limbs ought to be massaged for a quarter of an hour, night and morning, with warm olive oil. Powder is not nearly so good, as the oil is absorbed and aids in the nutrition of the muscles, whereas the powder is not.

4. *Drugs.* There ought to be no question as to which is the best drug in such cases. As chorea is practically always rheumatic in origin the drug to give is sodium salicylate. Personally, he prefers acetyl-salicylic acid, which is more readily taken by children as a rule. In any case, such drugs must be given in large doses, say 10 grains thrice daily to a child of five years. In order to diminish the tendency which sodium salicylate has to produce acidosis, it is generally advised that it should be given in combination with sodium bicarbonate. His opinion is that the latter tends to diminish the activity of the salicylate, and if it is given at all it should be administered quite apart and not in combination. The routine prescription for liquor arsenicalis cannot be too strongly condemned. He has known cases in which symptoms of neuritis developed where arsenic was being administered. Large doses are necessary, and it must be remembered that arsenic is a poison. Moreover, arsenic does not cure rheumatism, nor can it aid in warding off those heart complications so often seen in cases of chorea.

In cases in which the movements are violent chloral hydrate is very suitable. It may be given per rectum when swallowing is difficult. Five grains may be given by the mouth every four hours to a child of ten years. Trional, in similar amount, has been recommended, but he has no personal experience of its value, although it is only fair to state that it has been found of great service in difficult cases by British pediatrists.

5. *Convalescence.* The child should not be allowed to return to play or to school too soon. The heart should be examined from time to time. A change to the seaside usually aids in restoring the patient. The clothing should be warm and light. Attention should be paid to boots and stockings as well as to underwear. Cod-liver oil is the best tonic; there is no substitute in such cases. A course of iron is sometimes a useful adjunct in the form of the saccharated carbonate. If the appetite is poor a teaspoonful of compound infusion of gentian may be given ten minutes before meals.

Throughout the course of the disease great attention should be given to the stomach and bowels. An occasional dose of hydrargyrum cum creta or of pulv. glycyrrhizæ co. is advisable. Medicines containing syrup are not usually well tolerated,

and it will be found that the simpler the remedies administered the less likely is digestion to be upset. Every patient who has suffered from chorea should be kept carefully under observation, as other forms of rheumatic infection are very liable to ensue. This fact should always be impressed upon the parents before taking leave of the case.

[We find aspirin too irritating for children, and that novaspirin is far better.—ED.]

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**THE VALUE OF SERUM TREATMENT.**

In the *Journal of the Royal Army Medical Corps* for October, 1919, KLEIN states that the value of antidysenteric serum may be considered from two aspects:

1. *Its power to save life.* His experience suggests that such power is available only during the first few days of the attack—perhaps five days, or even six days, if the intravenous method be used.

2. *Its effect on the rate and completeness of recovery.* As is well known, in the more severe cases the initial dysenteric phase is succeeded by a state of profound prostration—the stage of "dehydration and profound intoxication"—characterized by rapid heart action, great muscular weakness, tendency to vomit or hiccough, thirst, difficulty in swallowing, and in extreme cases the typical "abdominal" facies—diarrhea may or may not have ceased. Abdominal pain is generally absent. This stage generally makes its appearance some time about the tenth day. Once it is fully developed, no serum treatment seems of benefit. Occasionally it is already present much earlier than the tenth day.

Between the critical period of the fifth to sixth days and the extreme toxic phase, there is an intermediate stage about the sixth to ninth day, during which antidysenteric serum may be given with a reasonable prospect of cutting short the attack and effecting a more complete recovery than would otherwise have followed.

To show this favorable effect of serum treatment a table is given. In it are contrasted forty-seven serum-treated cases with 134 non-serum-treated cases—fatal cases being excluded—to show the duration of the dysenteric stage and occurrence of sequelæ in the two groups. In grave cases the duration of the disease was practically identical.

The term "persistent colitis" is applied only to cases in which a dysenteric state continued for at least a month. This complication occurred twice in 51 serum-treated cases as against 28 times in 134 cases not treated with serum. Two serum-treated cases that suffered from arthritis both received their serum as late as the ninth day of their illness. In an analysis of cases treated with antidysenteric serum it was stated recently that "not a single case of dysenteric arthritis occurred amongst patients who were treated on or before the fifth day of illness."

Klein reaches these conclusions:

1. Antidysenteric serum should be given in large doses, about 60 to 100 cubic centimeters.

2. It is best given intravenously.

3. It is most efficacious when given early in the disease.

4. From the point of view of serum treatment a severe case of bacillary dysentery may be considered in three stages.

(*a*) From the onset of the illness to a period somewhere about the fifth to the sixth day. During this stage antidysenteric serum (especially if given intravenously) has a most favorable effect, both as regards averting a fatal result and hastening recovery. A minority of cases fail to respond even to this early treatment.

(*b*) An intermediate stage, from about the sixth to the tenth day. A case having reached this stage is likely either to die or recover, irrespective of serum treatment. Nevertheless the rate and completeness of recovery may be still affected by serum, especially if given in large doses, such as 100 cubic centimeters.

(*c*) A third stage—the stage of "dehydration and profound intoxication"—gener-

ally starting about the tenth day. During this phase of the disease serum treatment is practically useless. A minority of cases which have lasted to the tenth day or beyond it (without passing into the third stage) are still benefited by serum given in sufficient amount.

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### PSEUDO-FLATULENCE OR "WIND GULPING."

SMALL, in *The Prescriber* for October, 1919, states that gastric pseudo-flatulence is a condition usually passed over very cursorily in text-books of medicine, and consequently it is one of those complaints which are apt to be overlooked in medical practice. The disorder is of comparatively frequent occurrence, and if recognized can be readily corrected; but failing diagnosis and treatment, the symptoms may persist for years; this very definite clinical entity is, therefore, deserving of more attention than it, as a rule, receives.

The disease is of neurotic origin, and its clinical features are so very characteristic that the diagnosis is usually made with ease. The patient is most commonly a woman between forty and fifty years of age, stout and anemic, who complains of gastric symptoms. Of these, "wind" is the most troublesome, and shows itself by constant eructations. Unknown to the patient, the wind of which she complains is in reality only atmospheric air which has been swallowed, and it is therefore odorless, in contrast to true flatulence of fermentative origin. The quantity of wind which can be eructated is unlimited, the patient only having to swallow a fresh supply to continue indefinitely. In practice the amount produced is greatly in excess of that common in true flatulence, and the patient may go on eructating noisily several times a minute for hours on end, until utterly exhausted. A further point of diagnostic value is that the patient can eructate at will, and practically at any time when requested to do so.

Other symptoms of gastric disorder are induced later, such as dyspepsia and loss of appetite; there may, therefore, in old-standing cases, be associated catarrh of the stomach, and finally a considerable degree of emaciation. The attacks of pseudo-flatulence are apt to be accompanied by great mental excitement, and this only further accentuates the tendency to continued eructation.

Like other manifestations of hysterical origin, variability of the symptoms is a common feature; one week the patient may be in comparative health, the next her gastric symptoms are very pronounced. Various stigmata of hysteria may be present, but these are by no means invariable. There is generally, however, an exaggeration of the knee-jerks, showing increased excitability of the central nervous system. The mental excitement which may accompany the attacks of eructation may be so extreme as to amount occasionally to a sort of delirium.

Gastric pseudo-flatulence is most commonly the result of "wind gulping," though the air may be ingested in other ways. The condition is similar to a pathological habit of the same nature, which is well known amongst cattle.

Treatment must be commenced by explaining to the patient the origin of her flatulence, and warning her that the habit of wind gulping must be discontinued. A diet should then be prescribed similar to that used in flatulence of natural origin; it should exclude substances liable to fermentation, especially carbohydrates, and is therefore to consist, as far as possible, of proteins. Milk, finely chopped meat, fish, chicken, rabbit, jellies, curds, and a little stewed fruit should form the major part of it. The meals should not be too large, and must be taken at regular intervals, and well masticated. Of drugs, nux vomica is the most useful, and may with advantage be combined with some antispasmodic, such as tincture of capsicum, spirit of chloroform, spirit of aromatic ammonia, made up with a bitter infusion. The mixture should be given before food.

When the digestion of the patient has sufficiently recovered to permit, the diet should be altered to one suitable for the treatment of hysteria, the patient being fed to the limits of her digestive power, and taking in particular large quantities of milk and eggs. The same drug treatment may be continued throughout, but it may occasionally be useful to administer in addition dilute hydrochloric acid, pepsin, or taka-diastase.

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## PRACTICAL SUGGESTIONS OR THERAPEUTIC NOTES.

SINHA, in the *Indian Medical Record* for September, 1919, states these as follows:

A glassful of skimmed-milk when taken on retiring to bed is efficacious in preventing night-sweat. It is a very valuable remedy for dropsy in old people.

For seatworms (oxyuris vermicularis) he injects into the rectum 3 or 4 ounces of tepid salt water for four or five consecutive nights, which kills the worms and cures the tenesmus.

He has found the following combination very efficacious in the treatment of frequent night emissions: Bromide of potassium and sodium 30 grains, and camphor-water one ounce, given at 6 and 9 P. M.

In the treatment of the bites and stings of poisonous insects, he has found a slice of raw onion placed over the parts, binding it on firmly and changing it once in two or three hours, very efficacious.

As long as there are signs of inflammatory febrile conditions with anorexia, do not be afraid to withhold food entirely. In case of gastritis, appendicitis, peritonitis, dysentery, abstinence from food is absolutely imperative. Even milk is very injurious.

To abort abscess being formed a combination of equal parts of a reliable fluid extract of aconite, opium and belladonna should be brushed over the location every three or four hours.

Where the voice has failed from fatigue (overuse in singing) or from mucous laryngitis, two or three drops of nitric acid in a glass of water, taken by sips, will prove curative.

In the treatment of piles he has had excellent results by the internal use of collinsonia, hamamelis, and cascara sagrada, equal parts, in 10- or 15-drop doses taken four or five times a day. A fluid extract of the remedies should be used.

Tincture of sabina in doses of 5 to 10 drops in water is not only an excellent remedy for leucorrhea, but also for uterine hemorrhage, menorrhea, chronic gout and joint affections, combined with patience and perseverance.

Prickly heat may be cured very soon by the local use of a two- or three-per-cent solution of sulphate of copper applied with a sponge, twice or thrice daily.

In the treatment of chronic nasal catarrh with cough and altered voice he has found sanguinarine nitrate gr. 1/64 taken every hour for 6 doses and then one every three hours a most efficacious remedy.

Buttermilk is retained and digested in some cases better than anything else. Some infants, run down and sickly from teething, will pick up at once taking buttermilk.

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## PROSTITUTION IN ITS RELATION TO THE PUBLIC HEALTH OF SAN FRANCISCO.

HASSLER (*California State Journal of Medicine*, August, 1919) notes that of 100 prostitutes 24 were feeble-minded, 39 were doubtful, 25 were dull, eight were of good average intelligence, one was insane, one was epileptic, and two were dullards with drug addiction. Only five exhibited on psychological test the adult intelligence. He concludes as the result of a somewhat large and at times trying experience as follows:

Suppression of prostitution in San Francisco has proven practical and successful, and justifies a continuation of the same law and enforcement measures during normal times that were started as a war measure.

A venereal disease hospital should be maintained by the city as a public health measure, supplemented by clinics where

proper treatment without cost can be administered.

Segregation should be made at the hospital which will tend to separate the beginner who is normal from the defective and hardened case.

The State should provide a place where the subnormal and defective can be sent and cared for after being cured of the acute condition for which they were quarantined.

An industrial farm should be maintained by the State where the normal and borderline cases can be sent for rehabilitation physically and where mental and vocational training may be had to fit them into the scheme of life which is possible only after a period of absence from the surroundings which enslaved them.

Without such coördinated and correlated connections the present system offers us no hope for the greater percentage of the women, as it cures them for the time being of their acute troubles and throws them back into the mill to be ground over again.

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## SECTION OF THE SENSORY ROOT OF THE GASSERIAN GANGLION.

Adson (*Surgery, Gynecology and Obstetrics,* October, 1919) notes that attention was called to this procedure by Spiller in 1898 and by Frazier in 1901. At the Mayo Clinic there were ten cases of trifacial neuralgia in 1917 and 28 cases in 1918. Two complications have attended the technique suggested by Frazier and Spiller: the occasional paralysis of the seventh nerve, and the trophic interstitial keratitis. Interstitial keratitis may occur independently of paralysis of the seventh nerve and may result in the formation of an opaque cornea. Hutchinson found that a seventh-nerve paralysis might occur as the result of detachment of the dura from the petrous bone, thus allowing the blood to enter into the small openings leading into the aqueduct of Fallopius; when the paralysis occurs it occurs immediately. It may be only slight at first, but becomes complete within a day or two. By the technique of avulsion of the nerve considerable trauma is exerted on the pons at the point of exit of the posterior root of the ganglion. It seems probable, therefore, that the occasional nerve paralysis is a trauma resulting in small hemorrhages and edema of the pons and of the brain stem. This is further verified by the results obtained when the posterior root is cut and not avulsed. No seventh-nerve paralysis occurred in 26 successive cases from January to August, 1919, since this change was made in the technique. In the operations performed by the author it was found that whenever interstitial keratitis occurred one of two things happened at the time of operation: either the dura propria had been split so that the ganglion was greatly exposed, or it was necessary to insert a large pack to control bleeding, thus causing pressure on the ganglion. If only the posterior margin and root were exposed there was never immediate keratitis.

As to the operation the patient is placed in a semierect position with the head in a special headrest, which may be raised or lowered to the position desired. A general anesthetic is used. The anterior limb of the question mark incision over the temporal region and down in front of the ear to the zygoma begins 3 centimeters posterior to the external angle of the orbit and 3 centimeters above a line drawn parallel with the zygoma. The skin flap is turned forward and the fascial flap covering the temporal muscle is turned backward, both being carried down to the zygoma. The temporal muscle is split and the skull exposed by a mastoid retractor. A subtemporal decompression is done, and an area of bone about 3 centimeters by 3 centimeters is removed. The dura is gently elevated from the middle fossa until the meningeal artery, which should be ligated, is exposed. The foramen is plugged with bone wax followed by further elevation of the dura until the posterior margin of the third branch appears. Dissection is then carried posteriorly and inward, exposing only the posterior margin of the ganglion; the dura propria is not opened until the region of the posterior root

is reached; thus injury of the ganglion is avoided, particularly of the inner portion, the cells controlling the ophthalmic branch.

Before the dura propria is opened over the posterior root, all bleeding is controlled. The dura covering the brain is held under gentle tension and the cavity is well illuminated by means of the ganglion retractor. After the dura has been opened the fibers of the posterior root are gently exposed and slightly elevated, and the guillotine knife is slipped over the fibers which are to be cut, thus avoiding any trauma of the pons or brain stem. The cavernous sinus is rarely injured, inasmuch as all of the anatomical marks may be seen clearly. The fibers of the posterior root just above the ganglion are turned down over the ganglion while the proximal fibers are pushed back into the posterior fossa. A small pledget of muscle is inserted into the dural opening as a plug. This assists in making a barrier between the severed ends and prevents the extensive loss of cerebrospinal fluid that usually follows when the patient recovers from the anesthetic. If there is any danger of bleeding it is well to insert a narrow strip of iodoform gauze, and remove it on the third day. The muscle and fascia are closed with interruptured sutures of chromic catgut No. 1. The skin is closed with interrupted sutures of silk, which are removed on the fifth day.

During the operation the eyelid is closed with adhesive, which is replaced by a Buller's shield before the patient leaves the operating room. The shield is worn for a week or ten days and subsequently is exchanged for close-fitting automobile goggles, to be used whenever the patient is exposed to wind or dust. In addition to wearing goggles, the author advises irrigations twice daily with a 2-per-cent boric acid solution.

The principles of the physiologic extirpation of the ganglion laid down by Spiller and Frazier have been carried out in the foregoing technique, except that the posterior root has been exposed without injury to the ganglion and particularly the cells supplying the ophthalmic branch, thus decreasing the frequency of trophic interstitial keratitis, and the posterior root is cut instead of avulsed, in this manner avoiding the occasional seventh-nerve paralysis.

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**EARLY TREATMENT OF HEMIPLEGIA.**

TAYLOR (*Surgery, Gynecology and Obstetrics*, October, 1919) states that in 1911 a Pittsburgh surgeon reported the case of a railroad conductor who was operated on for cerebral apoplexy and showed some months later no evidence of ever having had trouble with the central nervous system. Hudson reported eight or ten cases. The method used is the ordinary subtemporal decompression with evacuation of the clot. A piece of bone two by three inches is removed, the dura is opened, and if the clot is in the brain a grooved director or a Cushing exploring needle is slipped in at the site of the clot and the latter extrudes of itself.

If one can get good results from patients with hemiplegia of long standing by a subtemporal decompression, as will be shown in some of the author's cases, this operation seems desirable in recent cases of hemiplegia. It will save them from a great deal of pressure and destruction of brain tissue, also from the usual spasticity of the muscles with resulting contractures.

It seems logical that decompression with evacuation of the clot should give all the recovery that can be gotten in hemiplegia and ten times as rapidly as by waiting for the clot to be absorbed. One may argue that it is not advisable to add the danger of operation to the pathological condition of the patient. This, however, is an erroneous idea. The operation is comparatively a slight one, no anesthesia is needed, the unconscious patient standing the operation well. There is no shock and very little bleeding. The whole thing is of little menace to the patient. It has been done several times without anesthesia.

Even in cases of thrombosis this operation may be tried, as the area of necrosis in the region of the obstructed vessel will be benefited by any procedure which dimin-

ishes or alters focal pressure conditions and therefore favors the establishment of collateral capillary or perivascular circulation.

Following a cerebral apoplexy the distal segments of the limbs, the feet and the hands are affected more often than those near the trunk. At the onset of the attack there is sometimes a temporary initial rigidity of the muscles of the paralyzed side, or an "early" rigidity may develop in one or two days. At about the second week there is always a "late" rigidity. This, which at first is slight, gradually increases and finally contractures affect the paralyzed limbs. The shoulder is adducted. The forearm is bent at a right or an acute angle, the hand usually pronated and slightly flexed, the proximal phalanges slightly flexed, the middle and terminal phalanges more so. The fingers are tightly shut into the palm of the hand. If an endeavor is made to straighten the forearm, the muscle tension has to be overcome; this may be wholly or only to a certain extent successful, but the forearm immediately returns to its former posture. The flexed fingers can be extended only if the wrist is put at first in extreme flexion. In the lower extremity the hip is adducted and internally rotated. Contracture of the knee is not very rare. The foot presents marked deformities. The tendo Achillis is contracted and the foot is in the posture of talipes equinovarus, *i.e.*, heel up, toes down and turned inward. The rule seems to be that the larger flexor groups of the extremities and the adductor muscles are selected. It is probably the disparity in strength between the flexors and extensors that determines the contractural postures as a result of the hypertonic condition of the muscles.

As to the method of treatment adopted by Boorstein, the lower limb was put in a plaster cast and extending from the toes to the perineum. The foot was at right angle to the leg and the knee extended. Though Tilney claims that full extension of the leg on the thigh not only causes an unnatural position of the body but by producing an unusual strain on the muscles will prove fatiguing, it seemed to the author that the comfort of the patient should be sacrificed for the prevention of the knee contraction. Hoffa, Lazarus and others have distinctly recommended the use of splints in hemiplegic paralysis of the leg, with elastic bands to replace the deficient flexion of the knee and to insure dorsal flexion of the foot.

If one is really looking for the comfort of the patient, he may order a brace with a drop ring to permit bending of the knee when required and to allow its extension on walking.

For the upper extremity, the shoulder is kept abducted to a right angle, by placing sandbags near the chest, or one may put the shoulder on a wire splint or a plaster spica, or a Jones abduction splint, which is so easy to apply. In choosing the best position for the elbow one has to remember that the tendency is for flexion at a right angle or an acute angle, and it would, therefore, be natural to place it in a straight line (full extension), but this would interfere with the use of the limb, as people cannot have much use of a straight arm. It seems logical to place it in a position midway between flexion and extension—*e. g.*, at an angle of 135 degrees. This is simply an arbitrary figure. The forearm is put in full supination.

The hand deformity is the hardest to handle and requires more guarding than the other parts of the limbs. The recovery is also less certain. It is therefore of paramount importance to have the hand slightly hyperextended at the wrist, say to an angle of 165°, while the fingers are straight, but in order to prevent hyperextension of the metacarpophalangeal joints, these may be slightly flexed. This position can be retained in a plaster splint, in a Jones "cock up" splint, or Taylor splint. All these contrivances or splints not only prevent contractures but also help a great deal to relieve the painful cramps so commonly found in these conditions.

These temporary splints are left on without disturbance until one is ready to begin with massage. If plaster has been used, it

is then cut into halves and removed for massage and exercises. If the patient can afford it, braces can then be applied, since it will be easier to remove them.

The question of prevention of contractures arises only in persistent hemiplegias. There are rare cases where the resultant paralysis is flaccid, *i.e.*, in extensive foci which involve both motor and sensory cortical areas. The muscles retain their posture but undergo moderate atrophy. These cases need no splints.

Opinions vary as to when to begin the exercises, ranging from one to six weeks. No specified time can be given, each case being considered individually in relation to its sensitiveness, the amount and character of the contractures. During the first week light passive exercises for the fingers, hands, toes, and feet are used. They must be performed slowly and easily. In the second week the forearm and leg likewise may receive passive motion.

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### ARTHRITIS OF THE KNEE-JOINT.

BONNET (*New York Medical Journal*, vol. cx, No. 6, 1919) considers the question of arthritis of the knee-joint following fissure fractures of the tibia. He notes that in structure the tibia may be considered as having the shape of a hat represented by the epiphysis and composed of spongy tissue, supported by the tibial shaft forming a cylinder of compact tissue which encloses a structure of vertical trabeculæ. The anterior tuberosity supports the thin cylindrical layer of compact tissue in front. This structure explains fairly well the tendency to fissuring of the bone in a vertical direction at the level of the diaphysis and the tendency to shattering at the level of the epiphysis.

It is not impossible that the cartilage of conjunction plays an important part in limiting the upward extension of the fissures by interrupting the anatomical continuity between the diaphysis and epiphysis, between the shaft and the crest. The age of the subject should enter into account in the anatomical shape of the fracture, and fissure fractures involving the joint should be more common after the age of eighteen.

A suppurating arthritis of the knee makes itself evident by changes arising in the patient's general condition which, in the simple cases, indicate purulent transformation of the fluid. The temperature goes up in successive oscillations from 98.6° to 102° F. or more, while the pulse follows suit.

Even after arthrotomy, performed when the first symptoms of sepsis appear, it rarely happens that things go on smoothly. Purulent tracts develop and travel down the calf by means of the serous bursa of the internal gastrocnemius. For that matter, suppurative processes of the calf are not always arthrifluent, and the author has seen a case of articular fracture of the tibia in which infection of the calf occurred directly through a fissure on the posterior aspect of the tibia. But these purulent tracts are not in themselves a cause of any notable interference with the evolution, and yet the prognosis remains a serious matter even after arthrotomy. This is because of a septicemic state which, according to the case, is to be attributed to two essential factors, namely, the absorption of septic matter from the greatly changed articular surfaces, and, second, an osteomyelitis in the focus of the fracture.

Absorption from the articular surfaces is a factor of considerable gravity. Examination of the parts after amputation showed that the joint surfaces of the tibia were greatly involved. The articular cartilage was red, thin, friable, and detached, resting on a blackened bone surface. Grayish-colored fungous masses were organized in the synovia and assumed a gangrenous aspect in the neighborhood of the infected osseous focus.

Osteomyelitis is practically sure to occur in open fracture foci of the upper end of the tibia. Composed as it is of spongy tissue, this structure is usually pathologically changed by the passage of a missile through it, and a gangrenous type of osteo-

myelitis develops when the projectile is not removed. A continued septic absorption ensues, even when the condition of the joint improves, so that the osteomyelitis finally demands an amputation sooner or later.

Every joint collection, appearing immediately after or within a few days, in cases of fracture of the upper end of the tibia due to a missile, even when the latter has involved the bone some little distance from the knee-joint, should be looked upon as symptomatic of fissuring into the joint and as bound to develop infection.

Once a suppurating arthritis of the knee has taken place the gravity of these fractures, even after arthrotomy, is considerable. In early intra-articular collections the fracture focus must be sterilized by curettage of the pulpy mass of infected bone, by the removal of the missile and other foreign bodies, and the use of ordinary antiseptics. The articular infection is to be dealt with by arthrotomy without delay. Resection of the knee is not indicated in such cases, and removal of detached bone pieces in the joint is alone permissible.

When the joint collection appears late in the progress of the case and puncture shows that the blood contained in the joint is absolutely sterile on culture media, the fluid may be removed by puncture followed by washing out the joint with ether, but in all other circumstances arthrotomy must be done. Only too often, regardless of this treatment, a septicemic state occurs and amputation at the thigh must be resorted to as a life-saving measure.

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### THE ADRENALIN TEST FOR HYPERTHYROIDISM.

For three years Goetsch (*American Review of Tuberculosis*), of the surgical clinic of the Johns Hopkins Hospital, has been practicing the subcutaneous injection of 7.5 minims of a 1:1000 solution of adrenalin chloride in patients who present marked symptoms of hyperthyroidism, but in whom no positive diagnosis can be made by ordinary methods of examination. If the patient, following the adrenalin injection, reacts with manifest symptoms of hyperthyroidism, Goetsch believes that a positive diagnosis of the condition is justified. The test is a valuable aid in determining whether the disease from which patients are suffering is purely a tuberculosis, a tuberculosis complicated by hyperthyroidism, or a pure hyperthyroidism. Hyperthyroidism, whether or not associated with tuberculosis, will give a positive reaction to adrenalin. Tuberculosis, uncomplicated by hyperthyroidism, does not react positively to adrenalin.—*American Journal of Surgery,* October, 1919.

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### THORACOPLASTICS FOR PULMONARY TUBERCULOSIS IN THE VEJLEFJORD SANATORIUM.

Saugman (*Ugeskr. f. Laeger,* 1919, lxxxi, 585) refers to the results of thoracoplastics for lung tuberculosis reported in Scandinavian literature by Jacobaeus and Key, Nyström, Bull, and others. He gives also his own experience based on the treatment of 26 cases during the last two years at his Vejlefjord Sanatorium. In these, treatment by artificial pneumothorax had been tried first without success.

The operation is performed usually with the aid of local anesthesia. Large doses of the anesthetic are necessary to block the nerves. The danger of such large dosage is shown by Saugman by reference to the case of a young girl who was treated by preliminary injection of veronal and morphine, followed just before the operation by the injection of 190 cubic centimeters of ½-per-cent novocaine solution. The operation, in which five ribs were sectioned and sutured, lasted only fourteen minutes, but the patient died shortly afterward. Such an occurrence, however, is exceptional. As a rule, local anesthesia is easier for the patient and greatly facilitates the operation.

A tabular statement is given showing the amounts of rib removed, generally from the fourth to the eleventh. Subperiosteal resection of the ribs appears to be the most advantageous, and it is well to perform the

operation in two stages. After the resection, the removal of adhesions, and the emptying of the pus pockets, the thorax collapses very considerably on the side operated upon. After hemostasis is effected the thorax is closed with catgut sutures in two layers.

Morphine, pantopon, etc., are given after the operation to allay pain and for stimulation.

In 12 of 18 cases there was apparently complete disappearance of the tuberculosis bacillus from the sputum after a few months. Cases of recurring hemoptysis were generally much relieved by operation, but in one instance it recurred fatally seventeen days afterward. There were also two other deaths—one from pulmonary embolism and the other from influenza. The latter occurred several months after operation, when the patient was free from symptoms of tuberculosis.

The article includes a tabular statement of all cases operated upon with case histories and several illustrations.—*Surgery, Gynecology and Obstetrics,* October, 1919.

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### THE TREATMENT OF FRACTURES OF THE FEMUR.

Carlsson (*Ueber die Behandlung von Bruechen am Oberschenkelschaft Nord. Med. Ark.,* 1919, li, Ark. f. Kir., 573) reports on all his cases of fracture of the shaft of the femur treated between the years 1910 and 1917. Treatment was controlled by *x*-rays. Five of the fractures were compound, but all were treated aseptically and behaved like ordinary fractures without complication. In two cases interposition of soft parts occurred, necessitating operative interference on account of nonunion. Two patients of seventy-nine and ninety-one years respectively were treated by means of sandbags and slight extension. The results were unsuccessful. Only the new-born and very small children were treated by reposition in splints or body fixation. With the latter method the limb is flexed directly on the abdomen and held in place by bandages according to a method similar to that used by obstetricians. The splints used were splints made of ordinary wood or the Volkmann wire splint. Only seven cases were treated by this method, six of them being children under three years of age. In two cases the results were perfect; in three there was a slight angulation of the bones at the site of fracture; and in one a shortening and lateral displacement.

One patient, a woman of seventy-one years of age, had a fracture of the lower third of the femur without any dislocation. After treatment with the Volkmann splint for forty-three days a good result was obtained, as shown by examination five and a half years later.

Thirty-one cases were treated by reposition in plaster-of-Paris casts. Of these 19 were treated exclusively by this method. They varied between five and seventy-eight years. There were eight transverse, seven oblique, and four comminuted fractures. The casts were left on for about 5½ weeks. In only four out of 19 was there no shortening. All the other patients had shortening of the limb amounting to from 1 to 8 centimeters. An ideal result was obtained in only one case, and in this case displacement was trifling.

The number of cases treated by open operation was 19. The age of the patient varied from seven to sixty-five years. In only two cases was the operative treatment undertaken primarily; in the others it was a secondary method following failures by other methods. There were two deaths from sepsis. The functional results were not uniformly good.

Ninety-nine cases were treated by indirect extension and vertical suspension, the age of the patients varying from six months to eleven years. Duration of the treatment varied from eight to forty-one days, the average being 21½ days. In 12 cases the method had no effect upon displacement and other methods were necessary. As an immediate result shortening was present in 41 cases, absent in 44; angulation and lateral displacement were present in 42 cases. The

danger of this method consists in adhesive plaster decubitus, which occurred in four cases.

Indirect extension with horizontal extension of the limb was applied in 39 cases. As to the late results 20 cases examined by the author personally showed no shortening, and the remainder shortening of from 1 to 5 centimeters. The functional result was apparently normal in 17 cases.

Twenty-nine cases were treated by direct extension; 21 with the Steinman nail extension method; and 8 with the Schmerz clamp or ice-tong method. In 24 cases the nail or clamp was applied to the condyles of the femur, in four to the head of the tibia, and in one to the malleoli. In eight cases semiflexion was adopted, flexing the knee on the thigh to an angle of about 135 degrees. In the remainder of the cases the thigh was flexed on the abdomen, but the leg was extended at the knee-joint.

The ages of the patients varied from 5½ to 79 years. Nine were less than 15 years old. In only eight of these cases was the method used primarily. Duration of the treatment varied from nine to thirty days, averaging twenty-three days. Shortening was entirely overcome in 24 cases, and in 9 of these a transient hyperextension was observed. In the remainder the shortening was overcome, in one case from 8 to 1 cm. and from 5 to 3 centimeters in another. In others no effect on the shortening was obtained. Hospitalization varied from 42 to 142 days, averaging 64½ days. Of the 24 patients who were heard from, four reported perfect recovery. Of 20 who were personally examined by the author, 9 showed no shortening, 4 showed lengthening of the limb, and the remaining 8 had shortening varying from 1½ to 7 centimeters. In only three was there no angulation or lateral displacement. Disability varied in 14 cases between two and eight months, averaging four and four-tenths months.

Of the 29 patients, 22 progressed without any irritation where the extension apparatus was applied. In two cases there was definite osteitis in the neighborhood of the foreign body. The nail or clamp had to be removed. The author states that the treatment must be individualized and based upon the patient's age, the primary displacement, muscular development, and general condition.

The aim of the method should be a perfect anatomical result as well as a perfect functional result. The former must not be obtained at the expense of the latter. The following rules are advised:

Every fracture of the femur should be a hospital case.

The treatment should be instituted as soon as possible after the injury and after a preliminary *x*-ray examination. The case should not be left over night, nor should the disappearance of the swelling be awaited.

The treatment must aim to correct the displacement during the first few days. If the method chosen does not accomplish this a more effective method must be substituted.

The reposition should be accomplished principally by permanent extension with the limb in the semiflexed position. A preliminary forced reposition is unnecessary, and if any time has elapsed between the injury and the time treatment is begun it is dangerous on account of the possibility of a thrombus.

Slight passive motions in the knee-joint should be practiced as early as the day after the application of extension. Slight active motions may be tried a week later. The removal of the extension apparatus should be followed by massage.

In the cases of adults weight-bearing should not be permitted sooner than ten weeks after the injury. Even in the cases of children care must be exercised in permitting weight-bearing.

The patient should remain in the hospital until all function is normal.

The greatest danger is infection. Primary infection is doubtless rare. It probably creeps from the skin along the foreign body, either nail or clamp, and is promoted by the reaction around the foreign body.

It is therefore evident that the smaller the foreign body the less the danger. For this reason the author prefers the clamp or ice-tongs. Strict asepsis is essential at the time of application. The daily use of tincture of iodine around the site of application of the extension apparatus is advised. Early removal of the foreign body is of primary importance. As soon as the displacement is corrected and considered firm enough the clamp or nail should be removed. It is better to replace it in a few cases than run the risk of infection by leaving it too long. The site of application also deserves some consideration. The condyle of the femur, of course, is the best and logical place. To apply extension at the calcaneus interferes with semiflexion. Christen objected theoretically to the use of the condyles because most of the muscles the pull of which we aim to overcome by traction are inserted into the head of the tibia, and therefore he believed the latter would be the logical place to apply the extension. By doing so, however, pressure occurs upon the joint surface, there is weakening of the joint ligaments from overstretching, and loss of tone may result with increased mobility. Only in the lowest fractures should extension be applied to the tibia to avoid the hematoma in the lower end of the femur and thigh if a nail is employed. Occasionally the nail becomes loosened in the bone and the danger of infection is much greater. The employment of the clamp obviates this.

A very important point is the position of the limb. The most advantageous position is semiflexion with the leg suspended in a hammock-like contraption suspended from a framework attached to the bed. The framework for the hammock as well as that for the extension should be attached to the bed so that the removal of the patient for *x*-ray examination may be accomplished without moving the limb. Contra-extension is rarely needed in the treatment of adults as the body-weight is generally sufficient. In the case of children it may be necessary. The value of frequent *x*-ray examination for control is hardly necessary to mention as it is self-evident. Constant watchfulness on the part of the surgeon is also necessary for a good result. Turning the case over to an interne after applying the extension is to be condemned. To obtain a good result a hearty and intelligent coöperation on the part of the patient is also necessary.—*Surgery, Gynecology and Obstetrics,* October, 1919.

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## DIPHTHERIA UNCONTROLLED.

Under this title CAREY (*Boston Medical and Surgical Journal,* July 24, 1919) concedes that much progress has been made in the control and prevention of diphtheria outbreaks, but with an average of 6500 or more cases being reported yearly, with approximately a 10-per-cent fatality, we cannot in truth say that we are progressing with endemic diphtheria.

Save in that period immediately following the introduction of antitoxin, there has been no marked interruption in the incidence or mortality of the disease. During the preantitoxin days, the average fatality percentage was about 28, while in the next twenty years, from 1895 to 1915, we see an average of 11.5 per cent, and for the next four years the average is little less.

Because of this stability of both mortality and fatality percentages for the past seventeen years, the department investigated 1000 deaths which occurred from diphtheria in Massachusetts, hoping to ascertain what factors might be present and common to all of these deaths, to fix a theoretical responsibility, and to plan, as far as possible, for their prevention in the future.

These statistics furnished much food for thought, and the author's findings were truly startling. Some of the more unsuspected findings were that 31.5 per cent of these deaths occurred in individuals who had been sick one week or more without medical attention; 11.8 per cent occurred in individuals who were moribund at the time of the doctor's first visit; 7.6 per cent occurred in individuals in whom the condition was unrecognized until it was too late for

the antitoxin to be efficacious, and 65 per cent of these deaths occurred in children who were five years old or under.

The source of infection was given as unknown in nearly 90 per cent of these deaths, and the form of the disease, in order of frequency, was laryngeal, pharyngeal, and nasal.

From these investigated deaths, it appears that more attention must be paid to this group of individuals who fall within a preschool age group, and intensive effort made to bring both to the profession and to the laity a more complete knowledge of the prevention and control of diphtheria.

The time will come when the Schick reaction, with its more frequent and intelligent use, will place a large percentage of the non-immune under our care for immunization, and if the statistics of the New York City Department of Health are correct, this means that our prevention will be in direct proportion to the efforts which we expend. With 60 per cent of the children of the pre-school age, that is under six years, needing immunization, which is available for them, is there not a chance for preventive work which will be really worth while?

The work done by New York has clearly demonstrated the value and safety of immunization by the toxin-antitoxin mixture. Dr. Park gives statistics of over 4000 children, 1000 of whom were about one week old, who have been immunized with this mixture, and no case of diphtheria has developed up to date among those so immunized.

The question may be raised as to how much responsibility for this continued high incidence of diphtheria lies with the boards of health of the cities. Statistics taken from the Census Bureau show that over 80 per cent of diphtheria deaths occurred in cities of over 10,000.

Viewed from this angle, the problem is placed at the door of the large boards of health; for, together with the largest percentage of cases and deaths, they also have or ought to have the necessary personnel and equipment for the prevention and control of the condition. Every city of this class has school physicians, school nurses, laboratory facilities, stations for the distribution of antitoxin, and the necessary regulations to enforce, by law if need be, quarantine and isolation.

What manner of excuse can be offered to explain our seeming apathy when asked by one who knows that all the necessary agents for the eradication of diphtheria are available, "Why do you have the same fatality percentage year after year?" What can the physician offer to the man who knows that diphtheria is curable, if treated early and with sufficient dosage of antitoxin, when he has had opportunity for the use of all of these by having been called upon the first day of the child's illness and has not made use of them? It appears that such a question would cause much consternation to the man who still persists in diagnosing diphtheria by odor, or by the appearance of membrane.

In the near future the time-honored "waiting for a report from the laboratory" will not absolve from blame the doctor who has been negligent; for the dictum offered by the public health workers that a throat needing a culture for diagnosis should have antitoxin administered at the time of taking the culture is fast spreading to the laity, and they will soon learn to expect such procedure from the physician to whom they entrust their welfare.

For the prevention and control of diphtheria all necessary agents are at hand; notwithstanding the accuracy of this statement, diphtheria is endemic in Massachusetts, possessing a fairly even death-rate year after year.

Should it become as evident to the laity as it is to us that the mortality of diphtheria is almost in direct proportion to the delay in calling a physician and the administration of sufficient antitoxin, there surely will be a greater attempt to fulfil this requirement for a speedy recovery from diphtheria; when they know that practically all who receive antitoxin within the first

twenty-four hours of onset recover, 95 per cent on the second day of onset, 87.5 per cent on the third, 78 per cent on the fourth, 61 per cent on the fifth, and less than 50 per cent on the sixth day, their sense of responsibility will be more keen, with resulting activity.

The dosage of antitoxin has been much discussed and without doubt will always vary; however, with a total of 27,000 units distributed by the department for each case reported, it appears that ample dosage is being used in most instances, together with sufficient antitoxin for immunization. There are two facts which everybody admits: that to have this medication effective, it must be given early, and it must be given in sufficient dosage; to this the author adds the suggestion that in all those cases which are seen late in the disease antitoxin may be given intravenously without harm and occasionally with most marked results.

Culturing of schools has long produced good results, and where completely carried out with reculturing, when necessary, gives us a real method of control. In some instances however, it has been noticed, the culturing stopped with the inmates of a certain schoolroom; neighborhood contacts, playmates, and visitors to the homes of those ill have not been cultured. Might it not be that there would be a greater chance of infection among those who come into close contact playing at games than in those whose chance for contact infection would lie in sitting in the same room at school? This is not intended as a criticism of school culturing, but rather to urge a combination of culturing for both school and neighborhood, thus eliminating a possible unknown or undetected source of infection. Does not the fact that 65 per cent of our deaths are in pre-school age groups point to the necessity of such a procedure? Here lies one of the greatest factors for the continued high morbidity.

The local boards of health, in the large majority of instances, receive notification that a culture is positive, and they in turn notify the physician. Here is a chance, at very little expense of time or money, to suggest, and, if need be, send to the doctor the antitoxin necessary not only for the treatment of the patient but also for the immunization of all contacts.

Actual experience has shown that in some instances the doctor had an insufficient amount of antitoxin for the patient and contacts, so used that which he had for the treatment of the patient, leaving immunization until the next day. It would seem possible, as a routine procedure, to telephone to the doctor, telling him of the positive culture and at the same time asking him how much antitoxin he will need for the patient, and how much for the immunization of contacts.

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## UTILIZATION OF THE MASS REFLEX IN THE TREATMENT OF INJURIES OF THE SPINAL CORD.

In a review of recent work on nervous diseases THOMPSON (*The Practitioner*, September, 1919) quotes an investigation in neurology by Riddoch upon injuries of the spinal cord.

The phenomenon named the mass reflex was first described by Head and Riddoch in *Brain*, 1917, in a paper which deals exhaustively with the reflex modifications produced by injuries to the spinal cord, and in the paper now quoted Riddoch deals with the practical significance of these reflex actions.

In uncomplicated cases of gross injury to the spinal cord, there occurs a period of shock which varies in duration from a few days to three weeks, during which time there is complete loss of function of the parts distal to the lesion. The skeletal muscles are in a condition of flaccid paralysis, the limbs lie motionless, and sensation is abolished.

The activity of all the reflexes in the isolated section of the cord is almost entirely lost, and associated with this loss there are retention of urine and feces and dryness of the skin.

As the effects of shock pass off this stage,

known as the "stage of flaccidity," is succeeded by the "stage of reflex activity," in which the paralyzed muscles recover their tone, the bladder and rectum begin to act automatically, and an area of skin varying with the level of the lesion may begin to sweat.

During the stage of reflex activity, it is found in a well-defined group of cases, especially when the spinal cord has been completely divided, that a nocuous stimulus, such as a scratch or a prick to any part of the paralyzed limbs, is followed by a flexor spasm of the legs at the hip, knee, and ankle, and also, if the lesion is high enough, of the trunk from contraction of the muscles of the abdominal wall. When the stimulus is fairly strong or applied to some spot in the middle line of the body —*e.g.*, the region of the perineum—the flexor spasm is often bilateral, there being a simultaneous contraction of the flexors of both legs and abdominal wall. Moreover, the effects of the stimulus may spread to other parts of the cord, and set the bladder and skin reflexes in action, thus producing evacuation of urine and sweating over a skin area corresponding to the level of the lesion. It is to this combined reflex action that the term "mass reflex" is given.

The reaction is most easily produced by nocuous stimulation of the soles of the feet, the external genitals, and anal region; but when the irritability of the cord is great, it may be set up even by such a slight friction as moving the bedclothes, and in some instances the spasm may be so strong as to jerk the patient almost out of bed.

The production of these reflexes on the slightest stimulation, though a source of great inconvenience to the patient and an addition to the difficulties of nursing, can, however, at times be utilized as an aid in the treatment of the paralyzed bladder. One of the greatest dangers to a patient suffering from severe injury to the spinal cord is that of infection of the bladder, and on this account the use of the catheter should be stopped whenever possible. When the bladder has begun to discharge automatically, but is still unable to evacuate its contents completely, Dr. Riddoch has shown how the "mass reflex" may be utilized to complete the evacuation and so obviate the necessity of catheterization for the removal of the residual urine.

The interval at which the bladder tends to discharge itself automatically must be noted for each patient, *e.g.*, every two or four hours as the case may be, the time differing for different patients, but being fairly constant for each individual when no complications are present. About the time the bladder is due to evacuate its contents, the "mass reflex" is produced by stimulating the abdominal wall or the lower limbs, with the result that the reflex activity of the bladder is reënforced and its contents entirely emptied into the bottle. The risk of wet beds is thus much diminished, and the patient is often able to carry out the whole process by himself. While use may thus be made of the reflex, the general effects of the spasms when uncontrolled may nevertheless be most distressing, and Riddoch further shows how certain gastrointestinal symptoms — often erroneously attributed to flatulence—and excessive sweating, which increases the liability to bed-sores, are both distressing features of the mass reflex. On this account the patient must be handled as gently as possible and all unnecessary stimuli avoided, while the intensity of those stimuli that are necessary must be reduced as much as possible in order to avoid setting up the flexor spasms and their unpleasant accompaniments. In addition to these symptoms, there are to be considered the general painful effects of flexor spasms, which may be so violent as even to throw the patient out of bed, and among the nocuous stimuli likely to set up these spasms—which must, as far as possible, be reduced—are overdistention of the bladder, cystitis, irritating bed-sores, and tension on the muscles of the limbs. The position in which each patient is easiest should be ascertained, it

being generally found that lying on the side with the lower limbs drawn up and the abdominal muscles relaxed gives the best results. Another useful posture is that in which the patient is propped up in bed in a semisitting position, with the legs flexed and a pillow under the knees.

In conclusion, Dr. Riddoch summarizes the matter by stating that endeavor should always be directed to allaying the excitability of the spinal cord by removing as many nocuous influences as possible. The limbs and the viscera, such as the bladder and the intestinal tract, must be treated with the greatest gentleness, and every care must be taken to avoid the generation of long-continued and violent mass reflexes.

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### THE INCIDENCE OF SYPHILIS AS MANIFESTED BY ROUTINE WASSERMANN REACTIONS ON 2925 HOSPITAL AND DISPENSARY MEDICAL CASES.

DAY and MCNITT (*American Journal of Syphilis,* October, 1919) base their report upon 2925 Wassermann reactions done as a routine on all medical cases admitted to the Barnes Hospital and the medical clinics of the Washington University Dispensary during the year 1918.

They note that weak cholesterin positives are, when not substantiated by clinical evidence, doubtful proof of the existence of syphilis. Hence only those cases having definite clinical evidence of the disease are included among those giving Wassermann reaction + + + cholesterin or less. Something more than 6 per cent of the private patients representing the upper social class are estimated as having syphilis. The percentage for pay ward patients is about twice as high; for free ward patients about three times as high; and for colored patients about five times as high. Of the white dispensary patients, socially on about the same footing as the free ward patients, 15.9 per cent are estimated as having syphilis, a figure somewhat lower than the free ward incidence. The colored dispensary patients showed an incidence six times as great as that characteristic of private hospital patients.

McLester is quoted to the effect that in a series of 300 consecutive private patients, 56 patients, or 18.8 per cent, gave a positive reaction. One-third of the positives also gave a complete history of infection.

Rosenberger reported in 1916 27 per cent of positive reactions with something more than 5000 cases from the Philadelphia General Hospital. In 1917 he had similar results from an equally large number of observations. Using the cholesterin antigen alone Walker and Haller found 12 per cent positive reactions among 1200 routine medical cases in the Peter Bent Brigham Hospital and Out-patient Department.

Vedder found among 1019 recruits 7.75 per cent undoubted syphilis and nearly 17 per cent as the total number of luetics as shown by the Wassermann reaction.

McNeil obtained 35 per cent positive reactions among 1200 negro males, all hospital cases. The purely medical cases gave 40 per cent positive. In a series of 200 apparently healthy negroes 24 per cent were positive.

The conclusions of the author are as follows:

The incidence of syphilis as shown by the Wassermann reaction was lowest among the well-to-do, about twice as high among the middle class of society, represented by the pay-ward patients, and about three times as high among the lower social class, or free-ward patients. The incidence of syphilis among colored patients was about six times that among private patients.

About 15 per cent of cases giving strongly positive reactions gave no clinical evidence of syphilis. This percentage increases with the cholesterin positive cases, indicating that a certain number of cases giving weakly positive Wassermann reactions with the cholesterin antigen only did not have syphilis.

The percentage of clinically positive syphilis is highest in the strongly positive

group (61 per cent) and lowest in the plus 1 positive cholesterin cases (7.3 per cent).

Weak reactions with the cholesterinized antigen are of value only when there is a definite clinical evidence of syphilis, in treated cases, or in cases of neurosyphilis.

Of 853 white males, 30 per cent gave positive Wassermann reactions; of 924 white females, 16 per cent were positive. Among colored patients 48 per cent of 200 males and 40 per cent of 273 females gave positive Wassermann reactions.

Among seven cases of diabetes giving positive Wassermann reactions, only one did not give clinical evidence of syphilis.

Of four cases of malaria giving positive Wassermann reactions, it seems probable that two of the positive reactions were due to malarial infection and not to syphilis.

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## FOUR FATALITIES FOLLOWING SALVARSAN.

BLANTON (*American Journal of Syphilis*, October, 1919) briefly classifies reactions of the salvarsan injection as:

Anaphylactoid reactions, appearing during the administration of the drug, lasting fifteen to thirty minutes and characterized by sensation of burning in the mouth, flushing of the face, injection of the mucous membranes, facial edema, nausea, vomiting, and a sense of suffocation. Occasionally the pulse becomes weak, the patient pale, and finally unconsciousness intervenes. Very rarely the patient dies. The anaphylactic nature of this reaction has been investigated by Swift in guinea-pig experiments. He believes that by salvarsan injections the patient's own serum may be sensitized—so changed that it acts like a foreign protein and is chiefly responsible for the reaction.

Deferred reactions, appearing several hours after the administration of the drug, lasting twelve to twenty-four hours and characterized by chills, headaches, vertigo, nausea, vomiting, diarrhea, fever, generalized pains, and occasionally skin eruptions.

Late reactions, appearing after twenty-four hours, and often not until the second or third day. Probably the majority of the fatal cases fall into this group. Beginning mildly with vomiting, diarrhea, and fever, these cases rapidly manifest headache, muscle twitching, dilated pupils, absent reflexes, and after a brief illness die in coma.

Other untoward effects, though less alarming, are encountered in: (*a*) Herxheimer's reaction, in which there is an intensifying of the luetic rash, said to be due to the sudden liberation of endotoxin, or to insufficient dosage; (*b*) the so-called neurorecurrences, in which neuritis develops in the cranial nerves, but especially in the optic and auditory nerves, an effect probably produced by the stirring up of a preëxistent process in these locations; (*c*) morbilliform skin eruptions; (*d*) jaundice; (*e*) albuminuria.

As Schamberg and his coworkers have shown, unfavorable reactions from arsphenamine are probably the result of impurities in the drug-identified by-products of synthesis, which for want of precise definition are spoken of as substance X. In their opinion the presence of this substance in certain batches of arsphenamine is undoubtedly the cause of the toxic phenomena encountered.

The four cases reported fall into the third group of reactions. All followed an intensive course of salvarsan treatment consisting of four to six intravenous doses. There was an average interval of four days between injections. Four- to six-tenths grammes of salvarsan were given at a time. Two days in three cases and three days in the other case intervened between the time of the last salvarsan treatment and the onset of the illness. The time elapsing between the admission to the hospital and death was two days in three cases and one day in the other. A striking similarity in symptoms as well as in post-mortem findings existed in all four cases. After a symptomless latent period of about two days the development of sudden and profound coma was characteristic and

dominated the clinical picture so that it was difficult to elicit any focalizing signs at all. There were no cranial nerve palsies. The pupils were dilated in two cases, in two unaffected. During the last twenty-four hours of life the reflexes disappeared in all four cases. Half of the cases had convulsions. Cheyne-Stokes breathing was present in all cases, and death was apparently due to failure of the respiratory center.

Pathologic study of the brains of these four cases showed similar lesions. These consisted in minute hemorrhages, scattered through and confined to the basal nuclei and that part of the cerebrum bounding the lateral ventricles. These were associated with a softening confined to this locality and seen easily on gross examination. Cerebral congestion and edema were marked. Increase of cerebrospinal fluid was not a conspicuous finding. In only one case was there a slight fatty degeneration of the liver.

These fatalities all occurred in healthy young men. Four cases occurring at one time could hardly be explained as an idiosyncrasy. The technique of administration can be exonerated in view of the fact that hundreds of other injections were given by the same method without reaction. The cause of these mishaps is undoubtedly to be found in the toxic by-products of salvarsan synthesis, the exact nature of which is unknown.

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### TEETH AND THE NATION.

Napoleon said that an army moved upon its belly, and it may be added that its motor members are its teeth. Bully beef and hard tack require good grinders, and the lack of them cannot be made up by an improvised ministry of munitions. What is true of war is true also of peace. The health of the nation lies in good digestion, and there is no good digestion (save in babes) where there are no teeth. Yet many of the people are toothless, and it is no wonder that the call of the insured patient upon his doctor is heavy.

Of recent years there has been a growing call for more and better dental treatment. There is no section of the medical profession which has not certified the necessity. The physician tells of progressive alimentary troubles, the throat surgeon of lymphoid growths and defective breathing, the eye surgeon of grave cyclitis and loss of vision, and all aver that the source of these troubles is a foul mouth and bad teeth. Finally, the war and the examination of recruits revealed a sorry tale of low categories due to defective teeth. Attention, so far, has been rightly centered upon the care of the teeth of the children, and to this end there has been a considerable extension of conservative surgery in the school clinics. But at the recent Conference of Local Medical and Panel Committees it was unanimously resolved that the additional services be made to include dental treatment.

The general conditions of dental work have been under consideration by a special committee of the British Dental Association, which has issued a report dated July 1 outlining a scheme to provide: (1) Dental treatment for expectant mothers and for children up to five years of age; (2) inspection and treatment of all children of school age; (3) treatment for all adults whether entitled to National Insurance benefit or not; (4) dental treatment as an essential element in the cure of tuberculosis and venereal disease. The committee recommended the establishment of a Dental Section of the Ministry of Health under a dental director. Uniform control would permit of the establishment of central dental clinics by local health authorities, where, by suitable arrangement and at different hours, the treatment of the first three of the above mentioned classes would be possible by the same staff. It is suggested that the staff should for the main part consist of permanent officers, with the help, if necessary, of part-time officers,

and that the various types of work should be well distributed so as to relieve the strain at present felt by the school dental surgeon who has to deal with children all his time. There should be suitable female assistance at each clinic, and the services of an anesthetist should be available. The clinics should be grouped round central laboratories, where the necessary mechanical work such as the provision of dentures could be performed.—*British Medical Journal,* Sept. 20, 1919.

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## SILENT RENAL CALCULI.

YOUNG (*Boston Medical and Surgical Journal,* Nov. 13, 1919) in an article under this caption concludes as follows:

In nearly 4000 autopsies at the Massachusetts General Hospital showing stone in the kidney or ureter, there was only one case with a completely negative history and urinary findings, and normal kidney macroscopically and microscopically; but there were four cases without symptoms and with a negative urine; six cases without any damage to be demonstrated at autopsy; and 15 cases in which the damage was too slight to compromise the integrity of the kidney.

Two cases with stones in calyces known to have been present for at least six or seven years, which had had repeated attacks of renal colic, showed, one a normal and the other an essentially normal kidney. Stones in the ureter more surely do kidney damage than stones in the pelvis or calyx, and a small stone if arrested in the ureter may do as much damage as a large one. Stones in the calyces can cause as much damage as stones in the pelvis.

Pus can be present during life without any evidence of infection or damage at autopsy, so that the presence of infection as well as of pus is necessary before important kidney damage is proved to be present.

The presence of a stone of any size in ureter, pelvis, or calyx may cause slight tissue changes, characterized microscopically as "slight increase of interstitial tissue," "slight arteriosclerosis," or "slight atrophy of renal elements;" but these lesions are not constant, and apparently are of little if any account so far as the work of the kidney is concerned; aside from this there is no damage done the kidney by the stone as such. But the vast majority of renal or ureteral stones do at some time or other cause some obstruction and always invite infection, and accordingly are sources of danger to the individual.

There is no arbitrary standard by which we can say that a given renal stone may or may not have to be operated on. But in any given case, without infection or other evidence of kidney damage, a calculus may be left alone until it is passed, until pain forces an operation, until evidence of infection and damage begin, or until it is shown to be increasing in size so that a pyelotomy becomes more difficult.

In the case of a ureter stone, if in spite of cystoscopic manipulation it has ceased to make progress, it should be removed after remaining stationary for only a relatively short time, in spite of possible lack of symptoms, as the kidney is almost certainly going to be badly damaged.

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## "PROTEIN SHOCK" AND INTRAVENOUS VACCINE THERAPY.

Under this title there is given in a leading article of the *Indian Medical Gazette* for September, 1919, an excellent résumé of this recent and still empirical treatment.

This new method of treatment, which has emanated from America, is beginning to attract world-wide attention. The protein shock reaction is brought about by the intravenous injection of a "foreign" protein—that is, a protein not normally present in the human tissues. Many different substances may be employed, those most commonly used so far being emulsions of typhoid and coli bacilli, though a similar reaction may follow the intra-

venous injection of horse-serum, proteose, egg-albumen, red blood corpuscles of an animal of a different species, or certain colloidal metals, though in the latter case it is probable that the protective suspension is at least partly responsible for the resulting phenomena.

It has been found from practical experience that bacterial emulsions containing the proteins of the coli-typhoid group are more efficacious in inducing the shock reaction than are those of other species, and therefore vaccines of coli and typhoid are commonly employed. The bacillus coli apparently never fails when given in suitable doses.

The diseases in which benefit by this form of treatment has been reported fall into four main groups:

Infective diseases in which the causal organism is unknown or not determined with certainty—such as rheumatic fever and acute arthritis of toxic origin.

Infective diseases in which the causal organism is known, but in which specific vaccine therapy is of little value—*e.g.*, gonorrheal arthritis.

Infective diseases in which the causal organism is known, and in which intravenous vaccine is given for both its specific and shock effect—*e.g.*, typhoid, paratyphoid, and coliform infections of the urinary tract, etc.

Chronic disorders of unknown etiology—*e.g.*, psoriasis, pemphigus, lupus erythematosus, and other skin diseases, such as lichen, eczema, and erythema induratum.

According to Cowie and Beaven, nonspecific protein therapy has been successfully made use of in severe cases of influenzal pneumonia. They conclude, from a careful study of the effects of this method of treatment, that the intravenous injection of up to 500 millions dead typhoid bacilli is a safe procedure; that it is indicated in the early stages—up to the third day—of pneumonia; that it is contraindicated when the myocardium becomes involved, or in acute endocarditis; that the immediate effect of the foreign protein is the development of a typical protein paroxysm, which is followed by a marked decrease in the temperature and a definite improvement in the subjective symptoms. Following the injection of the typhoid protein there is a characteristic leucocytic movement, although in the cases studied there was only a moderate leucocytosis and no permanent improvement in the leucopenia ensued. In some favorable cases the intravenous injections of typhoid protein may bring about the termination of the acute symptoms in influenzal pneumonia in from one to three days.

Gow states in an interesting article in the *St. Bartholomew's Hospital Journal* that, within fairly wide limits, the size of the dose has but little effect on the severity of the reaction. A severe reaction may follow a dose of 50 millions dead coli bacilli in one case, and a mild reaction three to four times this dose in another patient. In order to effect the desired result it is necessary to produce a moderate reaction. The dosage in successive injections must be progressively increased so that a like train of symptoms may follow after such inoculation.

The reaction due to "protein shock," in the afebrile subject, from an intravenous injection of from 50 to 100 millions killed coli vaccine, takes the form, after three-quarters of an hour or so, of involuntary twitchings of the muscles of the legs. This may spread to the trunk and become general and last for half an hour. Before this rigor is finished the patient has intestinal discomfort, with nausea, and even vomiting; he has headache, usually frontal and sometimes pronounced.

Just prior to the onset of shivering the temperature begins to rise and continues to do so for about six hours. It commonly reaches 103° or 104° before returning to normal at the end of twenty-four hours. Defervescence may be interrupted by a short secondary rise of a degree or so. The pulse frequency is increased during the reaction; the spleen may enlarge, and the

blood-pressure after an initial rise commonly falls for twelve hours or so before returning to normal.

The intravenous injection of bacillus coli vaccine causes an almost immediate fall in the white blood cells, in which polymorphonuclears, lymphocytes, and large mononuclears are all early involved. Following a first injection the retreat of the polymorphonuclears from the peripheral circulation is extremely hurried, and, at the end of the first hour, they may be outnumbered by the lymphocytes. By the second hour signs of a rally may be evident, and by the fourth hour the preinjection figure may be reached.

A rapid increase then takes place, and a maximum of 20,000 to 30,000 is reached in about twenty-four hours. This rise is succeeded by a fall during the next forty-eight hours to the preinjection figure or even below it. During the leucocytosis, myelocytes frequently appear, and normoblasts have also been met with.

After the second and third injections, the polynuclear leucopenia is of shorter duration, and the leucocytosis of more rapid development, though less sustained.

Many cases have been treated by this method by different observers, and on the whole very favorable results have been reported. Thus, Cecil reports forty cases of rheumatic fever, acute toxic arthritis and gonorrheal arthritis, which were subjected to this form of non-specific therapy. The rheumatic fever cases did well; about 40 per cent recovered completely in from two to ten days. Seven patients with gonorrheal arthritis showed temporary improvement for twenty-four hours, and the joint-pains returned. Other observers record similar results.

Acute diseases other than different forms of arthritis have been treated—in some cases satisfactorily—by the intravenous injection of typhoid vaccine. In typhoid fever itself, both sensitized and non-sensitized vaccine have been used by several workers. Gay summarizes their results and adds ninety-nine cases of his own, which show a mortality of 6.6 per cent, and thirteen complications.

He states that the milder cases react better than the more severe, but even the more severe will in many instances be benefited, and even aborted. The disease was aborted in one-third of the cases in his series, benefited in another third, while in the remainder it was unaffected. The liability to complications appeared to be diminished, but as a means of preventing relapse the injections are of little value.

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### TRANQUIL TRACHEOTOMY.

St. Clair Thomson (*British Medical Journal,* Oct. 11, 1919) observes that as a general rule the opening of the trachea is accompanied by so much disturbance that there often ensues a scene which the elder dramatists would have described as one of "wild excursions and alarums!" It is depicted in the following words by Clinton Wagner: "The introduction of the knife, together with a flow of blood, produces violent reflex action. The larynx rises and falls spasmodically and very rapidly, and the use of a knife or scissors is fraught with danger. The operator at this moment has need of all his coolness and presence of mind. Blood will find its way into the trachea and lungs, and death on the table from asphyxia may suddenly take place."

All this commotion can easily be avoided by the intratracheal injection of cocaine in the way to be described. The author acknowledges indebtedness for the idea to Dr. Crosby Green, who, in an article on "Thyrotomy for Cancer of the Larynx," describes how, before splitting the larynx, he injected a one-per-cent solution of cocaine through the cricothyroid membrane into the cavity of the larynx. He, it appears, is not in the habit of performing a preventive tracheotomy in this operation, and he makes no mention of injecting cocaine within the trachea.

An ordinary hypodermic syringe is

charged with about twenty drops of a 2½-per-cent solution of cocaine. As soon as ever the tracheal rings are laid bare the syringe is grasped, as one does a pen, with the forefinger about one inch from the extremity of the needle, and with this the windpipe is sharply stabbed between two tracheal rings. The middle, ring, and little fingers are resting on the neck, and they prevent the point from penetrating more than a quarter to half an inch within the lumen of the trachea. The cocaine solution is injected into the cavity of the windpipe, some five to fifteen drops, and the needle is sharply withdrawn.

The liquid in the windpipe at once gives rise to a slight, stuffy cough. It causes no spasm or distress, and as it trickles down toward the region which endoscopists know to be the sensitive spot of this area—namely, the carina at the bifurcation of the trachea—this tickling cough soon ceases. If there is no great urgency, ten minutes should be allowed to elapse, the time being occupied by clearing the front of the trachea, checking all bleeding, preparing the tube, and so forth. At the end of that time the incision can be made into the trachea and the cannula introduced without pain, spasm, or even the slightest cough, as quietly and smoothly as the original incision through the skin. The calm with which this proceeding takes place is in striking contrast with the agitated, hurried, and often bloody and dangerous operation of former days.

The strength of solution used is 2½ per cent of cocaine. In children a 1-per-cent solution and five drops would be sufficient.

The method is employed with either general or local anesthesia. Local anesthesia is sufficient in all adults when the opening of the trachea is the only operation to be performed at one sitting. With novocaine used endermically, and the cocaine used in this way within the windpipe, there is neither pain, spasm, nor coughing in performing tracheotomy.

# REVIEWS.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart A. Hare, M.D., assisted by L. F. Appleman, M.D. Volume IV, December, 1919. Lea & Febiger, Philadelphia, 1919.

The articles in this issue of Progressive Medicine are contributed by Dr. Edward H. Goodman upon Diseases of the Digestive Tract and Allied Organs; by Dr. Henry A. Christian of Harvard University on Diseases of the Kidneys; by Dr. Charles W. Bonney on Genito-Urinary Diseases. Dr. Walter Estell Lee writes upon Surgery of the Extremities, Shock, Anesthesia, Infections, Fractures and Dislocations, and Tumors. The final article is a Practical Therapeutic Referendum by Dr. H. R. M. Landis.

Altogether the present issue covers 419 pages. All of the authors have already made notable contributions to the subjects of which they treat, so that their criticisms and suggestions are of value. Some of these articles, notably that of Dr. Lee, are copiously illustrated with figures which clearly show what the physician or surgeon should do if he desires to carry out the suggestions made in the text.

OUR NERVOUS FRIENDS. By Robert S. Carroll, M.D. MacMillan Company, New York, 1919.

This book is designed to illustrate the mastery of nervousness and is written by the Medical Director of Highland Hospital, Asheville, N. C. In its twenty-three chapters it deals with the nerves of our friends, with the Neurotic, the Price of Nervousness, the Crime of Inactivity, questions of

diet relating to nervous disorders and the questions of work and play, and "Willing Illness." An interesting chapter is entitled "From Fear to Faith," illustrating the curative power of helpful emotions. Another chapter is entitled the "Battle with Self," and still another "The Suffering of Self-Pity." The last chapters deal with the "Finding of the Victorious Self" and the "Triumph of Harmony," illustrating the Power of the Spirit. It is evident from the title of these chapters that the book, while a medical one, is designed not only for the profession but for the laity as well. Indeed, it may be said to be more applicable to the latter than to the former. It is written somewhat on the style of a novel, and doubtless many physicians have patients to whom they will be glad to give it, since by this means the nervous patient may have the error of his way pointed out to him as well as the correct way for recovery, for in many such "Finding the Victorious Self" and recognizing the folly of self-pity results in cure.

THE PRACTICAL MEDICINE SERIES. Under the general editorial charge of Charles L. Mix, A.M., M.D. Volume II: General Surgery. Edited by Albert J. Ochsner, M.D., F.R.M.S., LL.D., F.A.C.S. Series 1919. The Year Book Publishers, Chicago. Price $2.50.

In his preface to this volume Ochsner calls attention to its especially rich material and to the splendid work done by surgeons of many nations because of war wounds and infections. The subject is considered under General Analgesics, New Instruments, Asepsis and Antisepsis, Infected Wounds and Their Treatment, Operative Technic, Amputations, Wound Healing and Pathologic Interventions, Shock, and thereafter Regional and Organ Surgery.

Special attention has been paid to infections, and on these pages will be found wisely and conservatively discussed practically all the worth-while papers which have appeared on this subject. It is to be noted that in considering dichloramine-T the older and now discarded solvent is mentioned, nor is there note of the more recent writings on this excellent antiseptic. As might be expected the subject of Empyema receives ample consideration, nor could one easily find a collection of abstracts and references bearing upon the literature of 1917 and 1918 more wisely chosen or more carefully and usefully condensed.

## CORRESPONDENCE.

### FORMULA FOR QUININE.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: In your December issue you quote Mayne and Carter from the *Journal of the American Medical Association*, October 11, 1919, under the heading "A Quinine Formula for the Treatment of Malarial Fever." I am prompted to submit a formula I used when doing general work. It may be well known to your readers:

℞ Quin. sulph., gr. iij;
Ferri pyrophos., gr. j;
Pulv. capsici,
Ext. nucis vom., āā gr. ¼;
Acid. arsenosi, gr. 1/40.

Make twenty such pills. Silver coat.

I used this extensively one summer while at a resort where I had a great many cases of malaria to treat, both native and imported. My method was to have the patient take one every three hours, or two and one-half hours, so that the fourth dose was taken at least one hour before the time the chill was due. I was able to assure the patient the chill would not arrive. This method was followed for the lot of twenty. A second lot was made up and taken thrice daily in the same way. The amount of quinine was reduced and the pill continued three times daily for perhaps two weeks, then twice daily, and finally once daily. Success was uniform. A case of break-bone fever from Texas yielded as all others had. A child of about four years having chills twice daily was reported to me one year later as having been cured by the use of these pills in a modified dosage.

Very truly,

F. J. BOWLES, M.D.

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